EDISON ELECTRIC INSTITUTE BULLETIN

BLI LIBR
JUN 8 39

JUNE, 1939

The Institute's Annual Convention 273

The World's Fair Session 277

The President's Report . . . . . C. W. KELLOGG 279

Officers of the Institute 284

The Outlook for the Electric Utilities . . . . . FLOYD L. CARLISLE 285

Wisconsin Electric Power Company Wins Coffin Award 288

Report of the Prize Awards Committee . . . . . H. P. LIVERSIDGE 289

The Present Status of Television . . . . . LENOX R. LOHR 294

Bernard F. Weadock Resigns to Resume Practice of Law 297

Progress in Rural Load Building . . . . . H. E. DEXTER 298

War Procurement and Electric Power . . . . . GENERAL CHARLES KELLER 301

The Case for Central Station Power . . . . . H. M. SAWYER 305

Balanced Load Building . . . . . GEORGE E. WHITWELL 311

Human Inter-Dependence . . . . . DR. ADAM S. BENNION 314

What the Customer Thinks of Utilities . . . . . ELMO ROPER 317

Some Practical Aspects of Public Relations . . . . . A. W. CONOVER 321

A Kilowatthour—When You Buy Electricity You Buy Work . . . . C. M. RIPLEY 325

Wiring—The Bottleneck of Lighting . . . . . EDWARD T. GUSHEE 328

Roasters the Big News . . . . . R. M. OLIVER 333

Conventions and Meetings, 336

EDISON ELECTRIC INSTITUTE

WEEKLY POWER OUTPUT

Electric Light and Power Industry (100% of Industry)

Data for Week Ending Saturday (12 o'clock Midnight)

	1939			1938			% 39/38	1937			% 38/37
1	Jan.	7	2,169,470,000	Jan.	8	2,139,582,000	+ 1.4	Jan.	9	2,244,030,000	− 4.7
2		14	2,269,846,000		15	2,115,134,000	+ 7.3		16	2,264,125,000	− 6.6
3		21	2,289,659,000		22	2,108,968,000	+ 8.6		23	2,256,795,000	− 6.6
4		28	2,292,594,000		29	2,098,968,000	+ 9.2		30	2,214,656,000	− 5.2
5	Feb.	4	2,287,248,000	Feb.	5	2,082,447,000	+ 9.8	Feb.	6	2,201,057,000	− 5.4
6		11	2,268,387,000		12	2,052,302,000	+10.5		13	2,199,860,000	− 6.7
7		18	2,248,767,000		19	2,059,165,000	+ 9.2		20	2,211,818,000	− 6.9
8		25	2,225,690,000		26	2,031,412,000	+ 9.6		27	2,207,285,000	− 8.0
9	Mar.	4	2,244,014,000	Mar.	5	2,035,673,000	+10.2	Mar.	6	2,199,976,000	− 7.5
10		11	2,237,935,000		12	2,014,729,000	+11.1		13	2,212,897,000	− 9.0
11		18	2,225,486,000		19	2,017,653,000	+10.3		20	2,211,052,000	− 8.7
12		25	2,198,681,000		26	1,975,239,000	+11.3		27	2,200,143,000	−10.2
13	Apr.	1	2,209,971,000	Apr.	2	1,978,753,000	+11.7	Apr.	3	2,146,959,000	− 7.8
14		8	2,173,510,000		9	1,990,447,000	+ 9.2		10	2,176,368,000	− 8.5
15		15	2,170,671,000		16	1,957,573,000	+10.9		17	2,173,223,000	− 9.9
16		22	2,199,002,000		23	1,951,456,000	+12.7		24	2,188,124,000	−10.8
17		29	2,182,727,000		30	1,938,660,000	+12.6	May	1	2,193,779,000	−11.6
18	May	6	2,163,538,000	May	7	1,939,100,000	+11.6		8	2,176,363,000	−10.9
19		13	2,170,750,000		14	1,967,613,000	+10.3		15	2,194,620,000	−10.3
20		20	2,170,496,000		21	1,967,807,000	+10.3		22	2,198,646,000	−10.5
21		27	2,204,858,000		28	1,973,278,000	+11.7		29	2,206,718,000	−10.6
22	June	3	2,113,887,000	June	4	1,878,851,000	+12.5	June	5	2,131,092,000	−11.8
23		10	2,256,823,000		11	1,991,787,000	+13.3		12	2,214,166,000	−10.0
24		17	.....		18	1,991,115,000	.....		19	2,213,783,000	−10.1
25		24	.....		25	2,019,036,000	.....		26	2,238,332,000	− 9.8
26	July	1	.....	July	2	2,014,702,000	.....	July	3	2,238,268,000	−10.0
27		8	.....		9	1,881,298,000	.....		10	2,096,266,000	−10.3
28		15	.....		16	2,084,457,000	.....		17	2,298,005,000	− 9.3
29		22	.....		23	2,084,763,000	.....		24	2,258,776,000	− 7.7
30		29	.....		30	2,093,907,000	.....		31	2,256,335,000	− 7.2
31	Aug.	5	.....	Aug.	6	2,115,847,000	.....	Aug.	7	2,261,725,000	− 6.4
32		12	.....		13	2,133,641,000	.....		14	2,300,547,000	− 7.3
33		19	.....		20	2,138,517,000	.....		21	2,304,032,000	− 7.2
34		26	.....		27	2,134,057,000	.....		28	2,294,713,000	− 7.0
35	Sept.	2	.....	Sept.	3	2,148,954,000	.....	Sept.	4	2,320,982,000	− 7.4
36		9	.....		10	2,048,360,000	.....		11	2,154,276,000	− 4.9
37		16	.....		17	2,214,775,000	.....		18	2,280,792,000	− 2.9
38		23	.....		24	2,154,218,000	.....		25	2,265,748,000	− 4.9
39		30	.....	Oct.	1	2,139,142,000	.....	Oct.	2	2,275,724,000	− 6.0
40	Oct.	7	.....		8	2,154,449,000	.....		9	2,280,065,000	− 5.5
41		14	.....		15	2,182,751,000	.....		16	2,276,123,000	− 4.1
42		21	.....		22	2,214,097,000	.....		23	2,281,636,000	− 3.0
43		28	.....		29	2,226,038,000	.....		30	2,254,947,000	− 1.3
44	Nov.	4	.....	Nov.	5	2,207,444,000	.....	Nov.	6	2,202,451,000	+ 0.2
45		11	.....		12	2,209,324,000	.....		13	2,176,557,000	+ 1.5
46		18	.....		19	2,270,296,000	.....		20	2,224,213,000	+ 2.1
47		25	.....		26	2,183,807,000	.....		27	2,065,378,000	+ 5.7
48	Dec.	2	.....	Dec.	3	2,285,523,000	.....	Dec.	4	2,152,643,000	+ 6.2
49		9	.....		10	2,318,550,000	.....		11	2,196,105,000	+ 5.6
50		16	.....		17	2,332,978,000	.....		18	2,202,200,000	+ 5.9
51		23	.....		24	2,362,947,000	.....		25	2,085,186,000	+13.3
52		30	.....		31	2,120,555,000	.....	Jan.	1	1,998,135,000	+ 6.1

NOTE: The first week of the year is taken as that week which includes four (4) or more days of the new year.

Vol. 7, No. 6, EDISON ELECTRIC INSTITUTE BULLETIN; published monthly. Entered as second-class matter Aug. 17, 1933, at the post office at Philadelphia, Pa., under the act of March 3, 1879. Publication office, 56th and Chestnut Sts., Philadelphia, Pa. Editorial office, 420 Lexington Ave., New York, N. Y. Subscription rate $2.00 per year in the United States; $3.00 per year in foreign countries.

The Edison Electric Institute does not assume responsibility for, nor necessarily endorse or approve, statements made by contributors to the BULLETIN.

EDISON ELECTRIC INSTITUTE BULLETIN

Volume 7 JUNE, 1939 No. 6

The Institute's Annual Convention

THE Institute's Seventh Annual Convention, held at the Waldorf-Astoria Hotel, New York, June 6-8, was repeatedly pronounced the most successful and stimulating utility gathering held since the beginning of the great depression.

Surpassing all expectations in attendance (registration, 2489) the convention was characterized by a realistic approach to the problems of the industry, frank discussions as to how they can best be met, and, an outlook, on the whole, more cheerful than has been apparent in a number of years. Beginning with a report by President Kellogg, the meetings presented a succession of discussions and reports justifiably evoking pride in the achievements of the industry and giving inspiration for further progress.

Three forenoon sessions comprised the formal program at the Waldorf-Astoria. In these periods twelve outstanding speakers reported on the state of the industry, its problems and objectives; its officers for the coming year were elected and installed; and prizes were awarded for the several contests sponsored by the Institute. On Tuesday afternoon the convention met in the Music Hall at the New York World's Fair, received a welcome from Grover Whalen, the Fair's genial President, heard descriptions of the leading electrical exhibits at the Fair, and then visited, in turn the exhibits of the Electric Utilities Exhibit Corporation, Consolidated Edison Company of New York, General Electric Company and Westinghouse Electric and Manufacturing Company.

An informal luncheon on Thursday noon provided the setting for an entertaining discussion, illuminated with many personal anecdotes by Mr. Thomas N. McCarter, Public Service Corporation of New Jersey and a greeting by Sir Harold Hartley, chairman, International Executive Committee, World Power Conference.

Meetings also were held by the Board of Trustees, the Operating Committee and a number of other committees including the Rate Research and the executive and planning groups of the Better Light-Better Sight Committee, the Modern Kitchen Bureau and the Home Lighting Equipment Sales Committee.

First General Session

The first session, held Tuesday morning, June 6, was opened by C. W. Kellogg, President of the Institute who gave a comprehensive report on the electric industry.

OFFICERS OF THE INSTITUTE 1939-1940

President, C. W. KELLOGG, 420 Lexington Avenue, New York, N. Y.

Vice-President, JAMES E. DAVIDSON, President of the Nebraska Power Company, Omaha, Neb.

Vice - President, PAUL M. DOWNING, Vice-President of the Pacific Gas and Electric Company, San Francisco, Cal.

Vice-President, A. H. KEHOE, Vice-President, Consolidated Edison Company of New York, Inc., New York, N. Y.

Vice-President, WM. E. MITCHELL, Vice-President, Georgia Power Company, Atlanta, Ga.

Treasurer, F. H. NICKERSON, Vice - President, Consolidated Edison Company of New York, Inc., New York, N. Y.

Vice-President and Managing Director, H. S. BENNION, 420 Lexington Avenue, New York, N. Y.

Secretary, MAE B. WOODS, 420 Lexington Avenue, New York, N. Y.

Commenting that the results of the past year have confirmed the long established reputation of the industry for relative stability, he said:

"It is encouraging to find ourselves no worse off than we are after six years of attack by the government," he said. "We must never forget, however, that, more important than all of these for our future welfare, is what our 27,000,000 customers think about us and about the sort of job we have done in the public service. During all these years that public has had to face so many and pressing problems of their own that we cannot ask or expect from them special sympathy with us in our specific troubles. They will size us up solely on the efficiency and dependability of our service and on the way we conduct ourselves in our daily relations with them and as citizens in their community. In my opinion it is the degree to which we have satisfied these our service obligations that has brought us to the present day still a strong, stable industry. It remains only to remind you, therefore, that our salvation is largely in our own hands. With our past achievements and with the resolve to do even better in future, I believe that we can and will work out that salvation."

Rate reduction, Mr. Kellogg said, has proceeded so far that extreme care must be exercised in the formulation of new rates to insure that the charges are compensatory for all classes of service at all points throughout the rate structure. During the past six years, due to attacks against the industry and actual or threatened government competition, rate reduction in certain areas have favored the customer at the expense of fair treatment to the investor.

Mr. Kellogg found the question of alleged power shortage largely a myth. Throughout the entire fifty-seven years of the industry's history, except in a few local instances, the industry has been able to supply all the electricity for which it could find a market, and a large part of its effort has been directed toward trying to create new and larger markets.

"The power generating capacity in America at the end of this year will be four times what it was at the end of 1917. The total annual electrical energy supply in this country at the present time, including the production of generating plants in manufacturing establishments, has reached about 140

billion kwhr, and the present generating capacity could supply 40 or 50 billion kwhr additional, assuming the factories working longer hours, according to war time schedules.

"The entire industrial energy consumption of the United States in 1917, supplied by both central stations and the generating plants in manufacturing establishments, was about 23 billion kwhr."

Mr. Wenzlick on the Real Estate Situation

"The United States is now in the intermediate period between a real estate depression and the next boom, and I am inclined to believe that experimentation with planned economy will prolong this period of waiting," the next speaker, Roy Wenzlick, president of the Real Estate Analysts, Inc., told the Convention.

"There has always been an intermediate period following every great real estate and construction depression before we entered the succeeding boom. Sometimes this period has been quite long, sometimes it has been relatively short. We are now in that period. Had we gone directly from the depression into a boom, it would have been a departure from the regular patterns of the past."

However, in Mr. Wenzlick's opinion, the building boom, when it comes, will exceed that of the '20's. Continuing his analysis of the housing situation, Mr. Wenzlick said:

"Activity in real estate and construction varies in a cycle which is quite different from general business. This cycle is characterized by its extreme length; from 1795 to the present it has averaged 18.4 years. There has never been a period shorter than 16 years between the peaks, or longer than 20 years. This building cycle is far more regular than the pattern of general business. Suppose we were to chart a regular curve whose length was 18 years from peak to peak and 18 years from valley to valley; one that would swing up in eight years and down in ten. We would be quite surprised by the fact that this curve would outline in a general fashion every real estate and construction boom and depression we have had in the United States. I know of no other line of business which has shown this degree of regularity.

"Building construction is further characterized by the extreme fluctuation from the top to the bottom of the cycle. At the bottom of the depression in 1932, residential construction in the United States averaged only 3 per cent of the level maintained in 1925. There are few industries in the United States which would show so wide a discrepancy, but a variation almost as extreme as this has characterized every great real estate depression in the United States during the past 150 years.

"In forecasting the future of real estate and construction, I would start out, however, with this assumption: That here we have had a rubber ball that we have been bouncing on the floor and for eight successive times over a period of 150 years it has bounced to about the same height, in about the same interval of time. Now, I will admit that if you change the ball, or if you change the nature of the floor, you will probably get some variation in the bounce, and clearly we have made some changes in the floor and we have made some changes in the ball, but as far as I can see, the ball is still going to bounce again.

"The ball bounces not because it bounced in the past, but it bounces because of certain fundamental reactions between rents and values and vacancies and costs, and we have analyzed those various factors, and we believe that sometime in the early '40's you are going to see the beginning of this boom. We think it is going to be at its peak about the middle '40's, and then we think it is going to start sliding down hill. When it first starts to slide, however, people won't know it is sliding, and a tremendous amount of activity will continue for the next four or five years, the same situation we had before. We hit the peak in 1925. By 1926, foreclosures were already starting to rise, and rise quite rapidly, and still no one accepted the warning.

"I believe during the next year you are going to find recovery proceeding rather slowly. There are going to be additional war threats, but in our opinion, nothing will develop in the next year about which European nations will be willing to fight, but, nevertheless, war or no war, these war threats will hold back new committments, will be a retardant to general business, and then, to, we have an election coming up next year."*

* Editor's Note: Mr. Wenzlick's address was built chiefly around business cycle charts displayed on the stage. Mr. Wenzlick regrets that it is against the policy of his organization to allow the reproduction of the charts, since they appear exclusively in reports to clients.

Mr. Carlisle on the Outlook for the Industry

Floyd L. Carlisle, chairman of Consolidated Edison Co. of New York, Inc., in discussing the outlook for the electric utilities, said that the industry has been one of the few leading industries to increase its output during the depression. It has shown ability to adjust itself to changing conditions.

"The fear of a European war and our possible involvement in it has undoubtedly played a considerable part in holding back our increased production," he continued. "There is a further widespread fear that we never can stop our present government deficit financing. In my judgment, after nine years of unbalanced federal budget, the surest thing to return prosperity is to determine at some time, in the not too distant future, to end this condition. It is, of course, quite possible to do this. It is to be hoped that private business can reabsorb the unemployed as the government lessens its expenditures for this purpose. A definite, certain program would, in my judgment, greatly restore confidence and lead to business expansion."

Asserting that the utility investor is more fearful of government competition than anything else, and that some believe the utilities are certain to be taken over by the government, Mr. Carlisle explained that it would require at least $15,000,000,000 of new government financing to take over the electric utilities either by direct purchase or by duplication to set up public ownership of these services. He pointed out that such a venture by the government would increase the public debt to such an extent that it would affect market value of all existing government bonds and render more difficult future government financing. He said such a program by the government, which no government believing in preservation of American private economy would attempt, would place an additional enormous tax burden on all other business.

Mr. Carlisle emphasized the fact that electricity is so interwoven with the life of the total population and the whole manufacturing and industrial economy that it cannot permanently prosper except as the whole country prospers.

"For more than thirty years the electric utilities of this country have in most instances been regulated by the states. We have been able to grow and prosper under such regulation, and there has been a tremendous expansion in the use of our services under it. The electric utilities can use every year large amounts of additional capital. They have demonstrated their ability to expand during the depression years. In the City of New York, since 1930, we have increased our output of kwhr 50 per cent. Gas and steam and telephone utilities can likewise provide additional investments that will in turn relieve unemployment. The vacuum in new and more modern machinery as a result of the depression constitutes an enormous field for private expansion."

Mr. Lohr on Television

Lenox A. Lohr, president of the National Broadcasting Company, discussed the status of television.

"My own opinion," he said, "is television today is technically good enough to go to the public. It is perhaps in the same state that the automobile was in 1910, that is, able to render very good service. I have had a set out at my home in Tarrytown for about three years. It has worked satisfactorily during that entire period, and even as long as three years ago my wife and children were able to run that set just as easily as they could their sound broadcast receiver. Those sets that are coming off now are even simpler than those earlier ones.

"We have tried many commercial programs," he said. "We believe that it will sell goods better than any other medium that has ever been devised, but that is still years off, and only the future can tell. What we are doing is pioneering. Every day that we put our foot down it is on new ground, ground that men have not trodden before. We are frequently very surprised at the results that we get from our own operators, but it is coming, and I certainly urge all of you to follow its progress with interest, because some day it is going to be a great social force and a great new industry."

Second General Session

The importance of the rural customer to the electric utility company, and a way to increase electric service to the rural customer were dramatically set forth by Harris E. Dexter, Vice-President, Central Hudson Gas and Electric Corporation, Poughkeepsie, N. Y., the

first speaker at the second general session, Wednesday morning.

In 1935, Mr. Dexter said, approximately 25 per cent of the population of the United States lived on farms; 12,407,614 of these people were agricultural workers and represented 24.4 per cent of all workers in the country. Electric service, however, is available today to 1,410,000 farms, or about one-fourth of the total. The real opportunity for the utility industry lies with these farmers and rural dwellers with electric service available.

"Electricity has brought to the farmer and rural dweller something they have never had before—a source of dependable power which makes it possible for him to make an automatic utilization of energy without human attention for extended periods of time," Mr. Dexter declared. "It is this automatic feature which is new to the farmer and which makes it possible for him to apply electricity, at a considerable saving in operating cost, to many operations hitherto carried out laboriously by hand. It is this automatic feature that has been largely responsible for increased demand for electric service in rural areas.

"When the customer's basic needs are known, the problem becomes one of harnessing electricity to the job. In this operation we must have full cooperation of the equipment manufacturer in order that we may get the best overall results for our customer.

"Due to the fact that the majority of this rural market is limited by its ability to pay for equipment, the most successful approach seems to depend upon our trying to supplant present sources of energy by electricity rather than to use the social aspect and attempt to sell a customer upon an entirely new standard of living. If we supplant present sources of power with electrical energy and do it for the same overall operating cost that the customer previously paid, we haven't taken anything away from him, and we haven't made him find any new source of money to pay for electricity. On the other hand, electricity, with the possibility of its automatic operation, generally will supplant enough labor on the part of the owner, his family, or his hired help, to make possible more time either for additional productive effort or for leisure, which eventually tend to better both his economic and his living conditions."

Mr. Dexter described an all-electric kitchen which is popular in his rural territory. It consists of an electric roaster broiler-top burner combination, an electric tea kettle and an inexpensive electric refrigerator, the complete outfit selling for $121.40 as a base price. Many of these are being sold at a price of two nickels a day, using meters that take nickels. "Business takes in ten to fifteen billion nickels a year out of nickel machines," Mr. Dexter declared. "Why not capitalize on this fact?"

General Keller on Power Supply in Case of War

The next speaker, General Charles Keller, of the board of directors of the Public Utility Engineering and Service Corporation, emphasized that no power shortage is likely to result in the United States if the nation becomes involved in war.

No detailed program for the war-time control of power has yet been published by the Government, but General Keller pointed out that "the agency established for that purpose must draw its principal personnel from the industry itself. . . . Experience in 1917 and 1918 teaches that the whole-hearted cooperation of the industry can be counted on, but this cooperation will be of greater service to the extent that the operators of power systems are assured of intelligent understanding and friendly and impartial consideration of such suggestions as they may advance."

By an amendment to the National Defense Act, General Keller said, Congress in 1920 imposed upon the Assistant Secretary of War "the supervision of the procurement of all military supplies * * * and the assurance of adequate provision for mobilizing materials and industrial organizations for war time needs." The War Department, General Keller explained, has properly interpreted this mandate to include consideration and control of electric power as an essential element in the procurement of munitions.

"In the event of war, control should be local," General Keller said. "Washington should enter to the least extent necessary to protect and supplement the supply of power. To this end, the district offices must be required to maintain and keep currently correct the information now collected in the power survey, thereby making known what has been called the power 'capability' of each district, that is, its ability to supply further demands, the measures proposed by the industry for supplementing the existing supplies and the assistance, financial and otherwise, that will be required to relieve existing or threatened overloads and to execute the plans for expansion. Close cooperation between the procurement agencies and the local power control unit will of course be established by the War Resources Administration so that war orders will be allocated with due regard to the availability of energy when production is to be begun and this cooperation will serve to reduce to a minimum the problems of the power control unit.

"In my opinion, it will be sufficient preparedness, to complete, in time of peace, detailed designs for generating units of agreed size, together with accurate bills of material and schedules of delivery for the various items in accordance with dates of completion that have been coordinated with the other requirements of the war program," General Keller said in conclusion. "In this way no money will be spent on needless or badly located plants while, under existing plans for war control, ample time will be available to install additional equipment for the generation, transmission or distribution of energy, or for two or more of those purposes, when and where it is needed."

Mr. Whitwell on Balanced Load Building

The absolute necessity for careful analysis of system conditions before undertaking any load building was stressed by the next speaker, George E. Whitwell, Vice-President, Philadelphia Electric Company, in a discussion of Balanced Load Building.

The utilities' greatest problem today is more net income, and according to Mr. Whitwell, balanced load building or carefully directed sales efforts requiring unremitting and highly intelligent effort is the answer. "Order-taking will not do," he said. "Neither will the blind selling in volume, no matter how big, of this or that device or appliance or method of using electricity.

"Rate reductions should always be made with over-all system load conditions in mind, so that disproportionate development will not be promoted," Mr. Whitwell told the delegates. "Perhaps one of the greatest dangers in the utility business, during the recent past and at present, is the fact that many rate reductions, through no desire on the part of the utilities involved, have had to be made to those customers who least deserve them or to too great an extent to the residential class, with consequent severe disruption to balanced load conditions. It is not enough, in such cases, that the methods used to regain sales balance be aimed at a present necessity in one classification. Such selling may even make a bad situation worse. The proper corrective measure may be the balancing of that selling by vigorous sales pressure among customers of an entirely different classification. Or, it is even sometimes true that the best answer to an apparent residential load necessity, for example, is intensive development of the commercial and industrial loads."

"A market approach of this kind obviously calls for a sales organization which lends itself to directional control in a very high degree. It also requires accurate and detailed knowledge of the market, which in turn calls for constant testing and analysis to determine the characteristics of individual and combination loads and for a wide knowledge of the equipment available to satisfy the requirements of the market.

"With changes in conditions," he concluded, "the utility sales program must be revised, not suddenly, but in a manner soundly based upon accurate knowledge. Such procedure, without doubt, is most in the public interest, is of greatest satisfaction to the utility's employee group, and is the producer of maximum return to investors."

Electricity Is Work—Mr. Ripley

"When you buy Electricity you buy Work," was the theme of a talk and demonstration by C. M. Ripley of General Electric Company.

Mr. Ripley gave examples to prove his point. A trip up the Washington monument on foot convinced him that climbing stairs was work—so he figured out how much work it really was.

"To raise the average man's 150 pounds up the 500-foot climb of the monument takes 75,000 foot-pounds of work. That looks big. But as hard a job as it is, the work in the climb is less than 3 per cent of the work in

one kilowatthour. So, the man would have to climb it thirty-five times before his work equaled the work in one kilowatthour—bought by the average housewife for about 4 cents.

After giving other examples of the work in a kilowatthour, Mr. Ripley said, "Any sales or promotion policy which does not encourage *complete* home electrification, endangers good and invites poor public relations. Because the customers don't use enough electricity to get it cheap. So they miss the electrical bargains. The way to get them out of the kicker class is to help them get a complete electric kitchen, laundry and automatic furnace. Then they will be happy and that should assure good public relations. Why?

"In such a family the dreaded drudgery is shifted from the home, where it was a burden, to the power house where it belongs. In addition, they save money, because it *does* cost less to live better. And boosting appliance sales boosts factory payrolls. More skilled labor is needed to build a cleaner than a broom, more to build a refrigerator than an ice box, more to build an electric fan than a paper fan.

"So surely, to the housewife and the farmwife, to industry and transportation—this magic business we are in is an unmixed blessing—to all concerned," Mr. Ripley concluded.

Third General Session

The opening feature of the Third Session was the presentation of the several prize awards administered by the Institute. Mr. H. P. Liversidge, Chairman of the Prize Awards Committee, E.E.I., presided at these ceremonies and gave the report of the Committee, which appears in another section of this issue.

Mr. Roper on What the Customer Thinks

The standing of the industry in the estimation of the public was discussed by Elmo Roper, distribution consultant, who has made extensive surveys on many subjects to ascertain public opinion. Mr. Roper spoke on the question of "What the Customer Thinks of Utilities."

His surveys showed, the speaker said, that the public is friendlier to the utilities now than it had been some time ago. This he attributed to the fact that many of the people in the electric utility business have improved, during the past five years as neighbors and citizens and merchants, and the surveys show that the public is aware of that improvement.

As to critics of business and industry, he said, "Time after time our cross-tabulations have revealed that the severest critics of certain big businesses are the most educated groups, the professional people. It has been said that all political revolutions start at the top and spread to the masses. It is my opinion that all effective demands for business reform start also at the top. Perhaps some of the politicians who seem to be embarked on an anti-business plank as a means of rabble-rousing have investigated and found that a considerable percentage of their most intelligent electorate is to be found among the critics of whatever business practice is under fire at the moment."

Mr. Sawyer on Power Competition

The expansion of Central Station Service is so definitely landmarked with isolated plant competition that it may truthfully be said that it has thrived on such competition, H. M. Sawyer, Vice-president, American Gas and Electric Company, emphasized in his speech on The Case for Central Station Power.

"I feel that an impersonal analysis of the competitive situation today and a review of the facts surrounding the growth of the industry should strengthen our confidence and reinspire us with the rugged determination we heretofore displayed in making the history of our growth," Mr. Sawyer asserted.

"The very lifeblood of Central Station Service was this ever-present isolated plant competition, and the industry's struggle for expansion, growth, and very existence was a healthy condition, supplying the basic motive for constant improvement and advancement. The electric utility industry's answer to this competition was and, I am convinced, always will be, constantly improved service, lower costs, new developments in appliances contributing to the health, happiness, welfare and profit of the customer, improved efficiencies and an aggressive and tireless process of not only selling but actually educating the public to the advantages of its service and product.

"The growth of the industry in the face of this competition is certainly indicative of the value and soundness of the basic principles of Central Station Service. We offend all tenets of logic if we suppose that such growth and such expansion come about other than as the natural result of basic and inherent advantages peculiar to Central Station Service, and it is permissible to contend further that those same advantages exist and are a definite part of our structure today."

After an analysis of the Diesel power installations, Mr. Sawyer concluded that an unbiased examination of the figures certainly does not justify the importance that the industry, as well as the general public, is prone to attribute to the Diesel engine and its potential effect as a competitor. "To the contrary," he said, "it would seem that our chief competitor is still steam and that Central Station expansion has occurred along lines that are not approached by either of the two competitors."

Dr. Bennion on Human Interdependence

Dr. Adam S. Bennion, Utah Power and Light Company, the final speaker at this session, declared that in the critical days of the last half dozen years we have tried various experiments by way of solution of our economic problems. "We have quarreled and threatened and coerced and 'appeased'." Finally, he said, "we are going to understand that the answer lies in joining hands to common purposes." Human interdependence is the key to modern progress, as it has always been in past ages. The significance of this human interdependence needs to be worked out in three fields.

The first is among business institutions themselves, he declared. No one institution can be jeopardized without harm to all the others. No one can be penalized without its affecting all the rest. Fundamentals of business are the same in all industries. There is no new magic to relieve us of business ills. Gradually we are coming to understand that what affects adversely the railroads affects the utilities and the insurance companies—large business and small business alike. Our hope lies in having the people of America understand fully what is involved in business success. It is the responsibility of all business to help the people to understand these basic problems.

Second, we need a fuller understanding as between capital and labor. When they are at war with each other, progress is stifled. After all, their problems are identical. For capital is more than mere money. It is creative ideas and intelligent management and the courage to adventure into new and untried fields. We have been taught a new social consciousness with reference to labor. Management can no longer ignore the problems of sickness, unemployment and old age. Force and coercion are primitive methods of attempting to work out human relationships in the field of labor. Together, capital and labor can make for progress. Constantly at each other's throats they make only for confusion.

The third major problem is one of the relationship between government and business. Stating the conviction that there are things enough for the government to do in its own sphere that it ought not to reach out to rival and to crucify agencies which have pioneered themselves into a successful field of operation, he expressed the hope that government and business may cease mutual indictments and adopt a plan under which business will sustain government and government in turn will sustain business. In no other way can progress be achieved, he concluded.

The Luncheon Meeting

The closing affair, and a highlight of the Convention, was the luncheon meeting held on Thursday at the Waldorf-Astoria with Thomas N. McCarter, Chairman of the Public Service Corporation of New Jersey, and first president of the Institute, as the principal speaker.

Mr. McCarter's address was preceded by a greeting from Sir Harold Hartley of London, Chairman of the International Executive Committee of the World Power Conference, who abandoned the presentation of a paper on the relations of government and industry in Great Britain (to be published in a later issue) to speak feelingly of the spirit of good will existing between his country and the United States.

(*Continued on page 278*)

The World's Fair Session

THE meeting held on Tuesday afternoon, June 6, at the World's Fair was a pleasant and informative excursion into the World of Tomorrow that drew many expressions of admiration and enthusiasm over the magnificent exhibits of the utilities at the Fair.

The ceremonies were opened in the Music Hall, filled by convention delegates and members of their families, with James E. Davidson, President of Nebraska Power Company and Vice-President of the Institute presiding.

Those who spoke were Floyd L. Carlisle, Chairman, Consolidated Edison Company, Owen D. Young, chairman of General Electric Company, Alfred H. Schoellkopf, President of Niagara Hudson Power Corp., and president of the Electric Utilities Exhibit Corp., D. S. Youngholm, vice-president of Westinghouse Electric and Manufacturing Company, Judge Charles W. Appleton, vice-president of General Electric Company, and Grover Whalen, President of the Fair.

After the program at the Music Hall, delegates visited in groups, Forward March of America and the Electrified Farm, the City of Light, Consolidated Edison's exhibit, the General Electric and the Westinghouse exhibits.

Excerpts from extemporaneous talks made at the Music Hall follow:

* * *

FLOYD L. CARLISLE

I am thrilled, as I never have been in my life, with the fact that the great American industries of this country have met the challenge. . . . Here in the New York World's Fair is demonstrated the ideal of America that the individual is everything and the state is for the service of the individual.

In the Consolidated Edison exhibit, we wanted to tell our story to the three million meter people who buy our electric and gas and steam service. A genius at dramatizing the industry, Walter Teague, conceived the idea of the great diorama that you will see in our exhibit. The story is very simple. Here is the world's greatest city; practically everything in it moves by electricity. The dramatization of the twenty-four hour cycle—night, dawn, day, twilight—with all the various activities of the city visualized so that the people can see, and told in blank verse to the accompaniment of music, tells our story far better than we can tell it through speech-making or other mediums.

Billy Rose, who has the "best show ever put on in New York," in the great State of New York Building, the Aquacade, said truthfully that the competition of the amusements in the World's Fair was not the amusement area; it was the tremendous, dramatic exhibit of the private American industries.

* * *

CHARLES W. APPLETON

In the face of this bigness, beauty and truly brilliant execution of the New York World's Fair, I know in my heart that men in the electrical industry cannot come to it as simple tourists seeking mere entertainment, for here they will receive inspiration, reasonable grounds for just feelings of pride in the contributions they and their predecessors have made to the upbuilding of an electrified nation, pride in the happiness and comforts that men and women enjoy today, as a result of the courage, patience, genius of the men and women of this industry.

Every light burning at the Fair grounds stands for sixty years of courageous research. Every motor that turns has behind it the vision and brains of thousands of men, many of them you and I have known intimately. And as you view these grounds at night, you will be impressed with the volatile force and burning energy of the workers in our particular vineyard.

To the electrical industry, the World of Tomorrow is not a foreign country, because we have helped to build it. If there is magic in the world today, it has been put there by the skillful application of electric power—in fact, so skillful and so swift has been its application, especially to the one-time drudgeries of the home, that the mechanics and economics of the achievement have left no sensible imprint on the public mind.

We hope that these electrical exhibits will help to teach the public that whatever there may be about the generation and utilization of electricity that may seem like magic, has only been accomplished through real toil on the part of those who have produced it.

* * *

DAVID S. YOUNGHOLM

. . . we want to be good neighbors. The electrical industries grouped together around the Plaza of Light have a common purpose. It is the promotion in a word, of the light of understanding on the part of the public of what this great industry of ours has accomplished and what it wants to achieve. And if credit is to be given to anyone, I feel it must be to that American spirit of private enterprise and initiative that still dwells among us.

The electrical industry has contributed so much to modern American life that no such great enterprise would be possible without it, without you whose labor and brains have made our industry a living and vital force today. Men who erect fountains of light and color on the Lagoon of Nations, transform the Perisphere into a bit of the celestial, build a canopy of light over a Court of Peace, cast new beauty on the faces of living trees, change dull buildings into gayety and grace are World creators. I hope you will enjoy its delights to the full. Then go home and tell the nation that this unbelievable land of illumination has actually come to pass and that the New York World's Fair presents an unsurpassed opportunity to view and enjoy the marvels of science and engineering that have been brought into being for mankind's benefit.

* * *

GROVER WHALEN

We estimated our attendance accurately enough, but we underestimated the enthusiasm of our visitors and the support they would give the fair and its exhibits.

I am particularly pleased to make that announcement to you members of the Edison Electric Institute—because you represent four outstanding exhibits, which singly must be considered as expositions worthy of public attention, and because the electrical industries are of such vital importance in any program advanced to promote better living conditions.

This exposition, in so far as the central exhibit area is concerned, is an attractive plea for the continuation of industrial individualism. Your exhibits clearly show that you are willing to modify that individualism to meet changing conditions.

The fair, since its opening, has been described as the world's greatest display of optimism. I would be the last to deny

that that is true, but I prefer to think of the exposition as the greatest display of faith we have seen in a long time, and the greatest display of industry's willingness to cooperate with government and social agencies in providing a future of which we may be proud.

As near as I can see, this country is not heading toward their chaos or any particular sort of revolution. It may be necessary, of course, to make some adjustments—and I believe that the American public will see to the making of these adjustments.

We are all united, surely, in the hope that the fair will assist the American temperament to slough off the idea that the Great White Father in Washington (whoever he may be) will provide porridge and peace a'plenty without the individual doing a lick of work.

We cannot measure the results as yet, of course, but it is more than likely that the fair, by giving the American people a glimpse of future possibilities, can cause them to drop back a decade or two and pick up their courage and industriousness.

The watchword for all of us must be cooperation.

Your exhibits are a mighty pleasant way of voicing your faith in the fundamentals of our present scheme of industrial development. You show how hearty is your acceptance of your social obligations. And it seems to me that the medicine you prescribe should be pleasant to take and sure of results.

There has not been a visitor that has gone to the exhibits of the electrical industry that has not come away with the greatest admiration and pride for the work that these companies have done.

The Fair could not have been built without them, and that goes in as forceful a language as I can put it . . . the contribution of these companies will long be remembered by America as a demonstration of the individual initiative and private enterprise that has made this country what it is today after 150 years of government under our Constitution.

ALFRED H. SCHOELLKOPF

It is a unique position I find myself in when it is publicly announced that I have the last word after Mr. Grover Whalen, but it will be very brief. You have heard and you will see that the Fair is a success. The building, our building, that you are about to see is the cooperative effort of 141 different electric light and power companies in the United States, and as you see the Fair and as you hear more about it, I am sure you will agree that the decision of those 141 companies—and I wish there were more—in entering this venture and joining with the Fair project is well justified.

The main exhibit that you will see and the purpose behind it I think is best expressed by a letter which I received last week, and I would like to read a few extracts from it, omitting the name of the writer, who is known to many of you.

He said, "I had a very interesting experience about a week ago in connection with the electric utilities exhibit. It has to do with the opinion of eight girls at planning college for women, one of whom happens to be my daughter. The group had just finished school and had embarked for New York to spend two days at the Fair. There is no question but they did the Fair very thoroughly. A week after their return to college, it happened to be Fathers' Week-end, and I was there and saw a good deal of these same girls. They were most anxious to talk about the Fair and were very enthusiastic about it. The important point is that each one of them had selected"—I hope these other gentlemen will pardon us—"the electric utility exhibit as the most outstanding and interesting that they saw.

"When I inquired as to the reason for this belief, each one says she obtained her first knowledge of what home and other conditions were prior to the introduction of electricity as we know it today. Each said that she realized for the first time the advantages electricity had brought to homemaking because of the contrast shown by these exhibits, and finally and most significant, each one felt that she had demonstrated to her for the first time the tremendous improvement in standards of living that had been brought about through the development of the production and utilization of electricity through private initiative and ownership."

The Institute's Annual Convention

(*Continued from page* 276)

Mr. McCarter, widely known for his ability as a raconteur as well as for his leadership in the industry, was at his best. His speech was informal, intimate, and filled with personal reminiscences that threw hitherto unrevealed, though highly favorable light, on the present and preceding world's fairs, and the international amities.

He said of the electric utilities, that while the industry has gone through all kinds of trouble, it is not so badly off when compared with some other lines of endeavor. He added, "Modern conditions, pretty recent conditions, have shown that all the rascals aren't in the electrical industry. When we see the transactions in which some high politicians and even the judiciary have been engaged, we can say perhaps to some of these highbrows, who criticize us so much in politics and otherwise, that they had better pluck the beam from their own eyes before they look for the mote in their neighbor's."

"When I think of hypocrisy," he continued, "I am reminded of the fact that there was in Princeton in my time and afterward, a very great preacher, the Reverend Doctor Alexander Hodge. He used to eke out his somewhat limited income as a professor at Princeton by filling the pulpits about the country. Upon one occasion he went out to Scranton.

"He arrived rather early in the morning and found out where the church was where he was going to preach. He went around to it and there was nobody there but the colored sexton. The colored sexton was very attentive, helping him on with his gown, and Dr. Hodge said to him, "Now, I carry around in my head about half a dozen sermons. What kind of a sermon do you think this congregation would like to hear?"

"Well, said the darky, "when I stops to consider de gentlemen that occupy the heads of the pews in the middle aisle, if I was you, I would go a little easy on the Ten Commandments."

Carrying the undivided attention, applause, and laughter of his audience from the moment of his fraternal greetings, Mr. McCarter's closing message was . . . "The great industry we serve, like Tennyson's brook, will go on forever. Let us see to it that we, who are temporarily charged with its responsibilities, pass it on to our successors, clean, unsullied and untarnished.

"And now, after the habit of Western New York, I extend to you, one and all, the Chatauqua salute, and in the words of the well-known evangelistic hymn, 'May God Be With You Till We Meet Again.' "

The President's Report

By C. W. Kellogg
President, Edison Electric Institute, New York, N. Y.

An address before the First General Session of the Seventh Annual Convention of the Edison Electric Institute, New York, N. Y., June 6th, 1939.

THE last calendar year has shown again the relative stability of the electric utility industry. While the index of industrial sales countrywide in 1938 was 17 per cent below the previous year, the electric utilities showed for the same period a decrease in gross revenues of only 6/10 of 1 per cent.

During the year 1938 the electric light and power industry made available for distribution 115 billion kwhr of electrical energy, a decrease of only 4 per cent from the previous year, when the total was the highest in history. The decline in business activity beginning in 1937, which was the most rapid in all of America's economic history, was reflected in the decrease in sales of industrial power which dropped by 16 per cent from 53½ to 45 billion kwhr. Increases in sales to other classes of customers, however, substantially offset this decline in industrial power. Small commercial service increased 4 per cent and domestic service gained over 9 per cent.

Generation for the first five months of 1939 was 10 per cent above the corresponding period in 1938 and 1 per cent above the first five months of 1937.

Electric generation by Federal power plants in 1938, although constituting only 3 1/3 per cent of the entire power supply, showed considerable gain over the previous year, most of which resulted from the installation of additional generators at Boulder Dam.

Coal consumption, due to a year of good streamflow, to increased efficiency, and due to the increase in hydroelectric generating stations, decreased 9 per cent.

Financial

Gross revenues in 1938 decreased 6/10 of 1 per cent from the high mark of 1937. The decrease was $13,000,000, from $2,181,000,000 to $2,168,000,000. Operating expenses, due partly to the good streamflow which enabled the further utilization of hydroelectric plants, showed a small decline, but the steady upward climb of taxes and of charges for depreciation nullified any such savings, and operating income for the year showed a loss of 3 per cent from the year before. Further declines took place in non-operating income, reflecting the continued decrease in the productivity of investment throughout all lines of business in the United States. The preliminary figures for net income reveal a decrease for the year 1938 of about $30,000,000, or 6 per cent from 1937 net income.

> *"During all these years the public has had to face so many and pressing problems of their own that we cannot ask or expect from them special sympathy with us in our specific troubles. They will size us up solely on the efficiency and dependability of our service and on the way we conduct ourselves in our daily relations with them and as citizens in their community. In my opinion it is the degree to which we have satisfied these our service obligations that has brought us to the present day still a strong, stable industry."*

These net earnings have paralleled the course of business activity to a remarkable degree, the net earnings for the first quarter of 1938 being 8 per cent under that of the previous year and the second quarter 15 per cent under. Improvement in industrial activity brought the third quarter to 4 per cent below 1937, while the last quarter was measurably ahead. It is gratifying to note that for this year, 1939, to date net earnings have recovered almost to 1937 levels. The percentage of net income however, is still far below its levels of ten years ago.

Government Relations

The curious spectacle continues of attack by Federal Government on the investment of its citizens in the electric utility business, even to the point of spending huge sums of money collected from the taxpayers to duplicate private investment. In the Pacific Northwest, where the degree of electrical development has for many years been far above the national average, the private utilities have developed a very complete network of high tension transmission lines, feeding into correspondingly complete distribution systems, carrying electricity to every nook and corner of the area. The logical procedure in bringing the output of the government plant at Bonneville on the Columbia River to the only market which could absorb it would be to feed into this existing network. This could be done for an estimated construction cost of $15,000,000. Instead, we find the government launched on a program to spend eventually $75,000,000 for additional transmission lines, $60,000,000 of which is pure duplication of existing facilities.

In the Tennessee Valley the TVA has negotiated the purchase of distributing utility companies at prices which are said to bear a reasonable relationship to the investment in them but the resulting loss in tax revenue to the state and its subdivisions is still an unsolved problem, brought no nearer solution by Senator Norris's statement on the floor of the Senate that if TVA paid the same taxes as are now paid by the privately owned utilities in that section, "TVA would be out of business in three months." (Congressional Record, April 13, 1939, page 5866.)

At Grand Coulee on the Columbia River, we find, from testimony before a Congressional Committee, that the detailed estimated cost of irrigation is $175 per acre, before allowing anything for the original cost and improvement of the land, for the cost of operation of the system or for carrying charges during the development period. The grand total is at least three times as much as the cost of farm land, amply irrigated by natural rainfall, of which there is

an ample supply in other parts of the country much nearer to a market for its products.

PWA Loans and Grants for Non-Federal Power Purposes

The first PWA allotment for power purposes was made in 1933. A brief review of the record of these projects may be of interest. As of May 1, 1939, the PWA has on its books a total of 477 non-Federal allotments involving power. The total estimated cost of these projects is approximately $281,000,000, of which $96,000,000 is offered by the Federal Government as a free gift, $96,000,000 is loaned by the Government at a low rate of interest, and the remaining $89,000,000 is to be supplied by the applicants.

Only 100 of the 477 allotments are for the establishing of new competitive municipal plants, and 46 of these competitive projects are located in the states of Alabama, Mississippi, Tennessee and Texas, in areas under the immediate influence of the TVA and the Lower Colorado River developments, where purchase negotiations are now in progress. Of the remaining 54 competitive projects, 17 have been completed, 19 are under construction or are still active, eight are in litigation, and 10 have been turned down by the municipalities concerned, although they are still carried on the PWA records. Thus, after six years, in areas outside of TVA and Lower Colorado River developments, 44 competitive projects are completed, under construction, active or in litigation. During the period from January 1, 1939, to May 1, 1939, PWA allotments for 43 new competitive municipal projects were rescinded.

Recent Municipal Elections

Since January 1, 1939, records of 25 municipal elections on proposed municipal plants and on franchises have become available. The most significant in this group is the very recent one in San Francisco, where a municipal ownership proposal was defeated, for the seventh consecutive time, by a vote ratio of two and a half to one. In the 25 elections, 14 communities, with a population of 671,618, voted against the proposals, and 11 places, with a total population of 22,339, approved the proposals. Of the 11 places voting for municipal ownership, only seven, with a population of 11,165, involved new municipal systems. The other four had to do with the building of generating capacity or the extension of existing systems.

Rates

The industry has continued to reduce its rates and to adjust and adapt them to promote greater use of electric service by the different classes of customers. This reduction has proceeded so far that extreme care needs to be exercised in the formulation of new rate structures to insure that the charges are compensatory for all classes of service at all points throughout the rate structures.

It was a decade ago that the utilities developed the now familiar inducement rates through which they have accomplished so much for the householders of the country. Next in importance to the development, wide distribution and reduced cost of electrical appliances, these inducement rates have undoubtedly done more to increase the use of electricity than any other single factor. The record is so impressive that it should be restated at this time.

In the 11 years ending with 1938, the average use of electricity per home was increased 110 per cent; and at the end of 1938 the average rate per kwhr in the home was but 62 per cent of what it was at the beginning. This would be a remarkable record for any industry whose basic costs remained fixed. How much more creditable does it appear, therefore, when considered in connection with a rise in hourly labor cost (in the last five years alone) of over 31 per cent and an increase in the 11-year period in the proportion of taxes to gross receipts of nearly 77 per cent!

The long history of rate reduction from the very beginning of this industry furnishes abundant proof of the fact that the electric utilities throughout their existence have passed on to their customers the full share of the savings incident to larger sales, increased efficiencies, improvements in management and lower cost of capital. During the past six years, due to attacks against the industry and actual or threatened government competition, rate reductions in certain areas have favored the customer at the expense of fair treatment to the investor. In spite of increased sales of 30 billion kwhr in 1938 as compared with 1932, the operating income for the entire industry in 1938 was 2 per cent below the operating income in 1932.

The real test of electric rates takes into account not only the resulting cost but the ability of the user to pay. Viewed from this angle the figures prepared last year by one of our great industrialists, Mr. Gerard Swope, are most eloquent. He said— "In the United States a man must toil 3.6 min. to provide for one kwhr of energy; in the nearest European country he must work 12 min., or over three times as long, and in one country he must work 43 min., or 12 times as long. In this country, generally, the development and distribution of electrical energy have been in private hands, and the problem of making it available to more and more millions of homes has been given constant study, so that now over 22,000,000 homes are electrically connected. The increase in use and the resulting conveniences are apparent on every hand."

Yardstick Rates

A few of the large Federally owned water power projects have been carried through to partial completion and some of the generators placed in operation, and reports have been submitted to Congress allocating the initial costs of these projects to various purposes and establishing an alleged financial basis for rates for the power sold from these generating plants. A large part of the cost of the dams has been allocated to purposes other than power generation. Little or no interest was charged during construction periods. In determining rates for power sold low rates of interest and depreciation were figured. With the exception of Boulder Dam, none of them are required to pay interest to the Treasury. Miscellaneous elements of expense have been ignored or underrated. Yet private enterprise is called upon to compete on a price basis with electricity priced in this artificial manner. In addition, for the support of government, private enterprise must pay a tax burden that amounts to 17 cents out of every dollar received from its customers.

In a land which boasts of fair treatment and of equality before the law, what must be the final verdict of the people with respect to this situation? Obviously, such business practices on the part of the government must sap the vitality and initiative of private enterprise. It makes for idle capital because there is offered no hope of reward to induce the employment of capital. America has depended heavily for its development upon the contribution of strong, capable and efficient private industry. If it is to continue to enjoy this same contribution, its national policies must con-

tinue to give hope of fair treatment to private enterprise.

No Power Shortage

I wish to say a word about the question of alleged power shortage. In all of their 57 years of history, electric utilities, except in a very few local situations, usually arising from severe drouth affecting water power, have been able to supply all the electricity for which they could find a market and a large part of their efforts has always been directed toward trying to create new or larger markets. In other words, the entire life history of the electric utilities has been a ceaseless effort to create power shortages so that they could build more and better generating stations, transmission and distribution facilities, find more employment for labor and capital and bring the advantages of electric service to larger numbers of people and classes of enterprise. At the present time our industry is expending annually $75,000,000, or over 3 per cent of its gross revenue, for "new business expense" to create a larger market for its product.

Lately the question has been brought up of the ability of the electric utilities, in case of war, to continue to supply the ordinary demands of the public for electric service and at the same time to carry the power load for the production of munitions. I do not propose to discuss this subject at any length, because we shall hear tomorrow a paper by General Keller on war procurement and electric power supply, but I should like to make a few observations.

The power generating capacity in America at the end of this year will be four times what it was at the end of 1917. The total annual electrical energy supply in this country at the present time, including the production of generating plants in manufacturing establishments, has reached about 140 billion kwhr, and the present generating capacity could supply 40 or 50 billion kwhr additional, assuming the factories working longer hours, according to war time schedules.

The entire industrial energy consumption of the United States in 1917, supplied by both central stations and the generating plants in manufacturing establishments, was about 23 billion kwhr. For those states which carried practically the entire load not only of supplying munitions to the American Army but also of filling the heavy munitions orders from the Allied Governments, the industrial energy consumption was about 15 billion kwhr. Of course, only a small part of this power was used in the production of munitions, as a comparison of power output during and immediately following the war clearly indicates. The whole amount, however, is but a small fraction of the present annual power supply and less than a third of the additional power supply that could be furnished by existing capacity if factories were on war time schedules with three shifts.

Manufacturing establishments have branched out geographically very considerably since the World War. War procurement plants are designed to distribute orders for making munitions to avoid the piling up of demands or concentration of orders on any one area.

In 1917 there was little interconnection between different power systems, while today interconnection is widely established among electric systems throughout the great manufacturing areas of our country—a development carried out since the war for the purpose of taking advantage of any diversity of demand between such systems and reducing of the capacity of reserve requirements in each. Partly because of this interconnection and because of other factors, the average production per kw of capacity increased from 2828 kwhr in 1917 to 3294 kwhr in .937, a fairly good industrial year; and, in war time, procurement plans that would increase the hours of use of factories could easily raise this figure to 4200 kwhr or more.

We are vastly better prepared to supply power for war needs today than we were in 1917. Although the population increase since 1917 has been only 25 per cent, we can produce nearly 400 per cent more power now than was then produced.

Ample generating capacity has been built by electric utilities to supply all the factories now in existence in this country except those which in spite of the continual efforts of our power salesmen still manufacture their own power. Until new factories are built, therefore, the increased demand for power in time of war, must be largely during the night and the early morning hours, that is in a higher utilization of existing capacity rather than in any great demand for additional generating capacity.

Based on their former experience the concern of electric utilities in time of war will probably be occasioned not by a shortage of generating capacity but on the contrary with how to sell the use of idle capacity. The use of electricity has grown to such an extent in enterprises that belong in the luxury class, which for that reason may be curtailed in time of war, that they fear there is more likely to be idle than overloaded capacity in war time.

Committee Work

One of the fundamental functions of the Institute is and always must be the opportunity it offers to its members to pool their thoughts and experience through committee activity, so that each shall get the benefit of what all know. This genuine cooperation by the 610 members of the various Institute committees has gone forward vigorously during the past year. The services of these men represent the unselfish contribution of time and money by the member companies, and not only collect and distribute timely and useful information but also give an opportunity to discover and develop the coming young men who will lead in carrying on our service in the future.

Individual committees have held two to four meetings during the year as their work required, and the published reports and minutes of these meetings reflect the direction and magnitude of their work. The Accounting Conference held jointly by the American Gas Association and the Institute in Chicago in December, 1938, drew about 550. At the Sales Conference in Chicago in March, 1939, the attendance was over 500, and at the Engineering Conference also held in Chicago, in May, the attendance was about 300.

Representatives of the Institute and the American Gas Association on two occasions have met jointly with a special Depreciation Committee of the National Association of Railroad and Utilities Commissioners to consider depreciation accounting. It is expected that further joint meetings will be held in order that our views on this difficult question may have consideration. During the past year our own Depreciation Committee has been carrying on extensive studies to arrive at a more definite knowledge of the facts in this matter.

Representatives of the Institute and the American Gas Association also met jointly with a committee of the National Association of Railroad and Utilities Commissioners to consider the feasibility of greater uniformity of rate structures.

We cannot commend too highly the willingness of the Association of Utilities Commissioners to join with us in round table discussions of these basic

problems. This attitude of mutual respect and toleration represents the acme of government regulation in our democratic process and should be of good omen for the future for both the utilities and the public they serve.

It would take too long to enumerate the various conferences between representatives of the Institute with other bodies relating to such matters as the code for overhead line construction, the code for interior wiring, insurance questions, merchandising, etc. Suffice it to say that important work of this nature is carried on in behalf of the industry in general and that about 350 representatives from our companies are so engaged.

Sales

The pressure for new business continues throughout the electrical industry. Because of less favorable business conditions, sales of electrical appliances in 1938 were substantially below the levels for 1937, but such sales for the first quarter of this year have shown a marked improvement. Compared to the first quarter of 1938, sales of electric ranges were up 23 per cent, of electric refrigerators up 41 per cent, of washing machines up 42 per cent and of water heaters up 100 per cent.

Since electricity is of value to the customer only as it is consumed in useful appliances, increased sales of electricity (and therefore the reduced price per kwhr arising from increased use) are much more dependent upon the invention, general acceptance and lower cost, through mass production, of electrical appliances, than upon any other single factor. This is no new discovery. The proceedings of the industry committees for the past 50 years will reveal the intelligent study and well directed effort of the industry to discover not only new uses and devices for consuming electric energy but the methods for bringing these appliances to the favorable attention of the buying public. As a result of this effort, the average householder, for approximately the same monthly bill he paid 30 years ago merely to light a few carbon lamps, now gets about four times as much light in his house, and in addition has an electric refrigerator that operates for less than his former ice bill, (not to mention an even greater saving in avoidance of food spoilage), has a radio set, a vacuum cleaner, possibly a washing machine and several minor devices, all working for the family.

The national sales programs sponsored by the Institute in conjunction with the National Electrical Manufacturers Association and other coordinated groups continue to be effective in promoting the sale of electrical appliances.

Electric utilities have approximately $750,000,000 invested in rural lines and equipment, and the problem of load building on these lines, with appliances that will enable the farmer to help himself through the effective use of electrical energy, continues to demand the serious attention of our commercial executives. Together with manufacturers and other groups also interested in this problem, it is to be hoped that we shall be able to develop further national sales programs which will be as effective in results as programs with which we are already familiar.

Although industrial sales were down 16 per cent in 1938, compared with 1937, yet over a period of years they have shown a very favorable relation to indices of industrial production. Our power salesmen have performed their work so well that comparatively few isolated generating plants remain, and new industrial load must come largely from increased use by existing customers. According to the 1929 Census of Manufactures, 76 per cent of all electric motors in industrial plants were served by purchased power. The 1929 Census was the latest one to include data on power utilization in industrial plants, but the developments since that time may be estimated by comparing the changes in the Federal Reserve Board Index of industrial production with our own figures for the sale of power to industrial customers. In 1929, when this Index showed an industrial production figure of 120, our statistics showed industrial power sales of 43 billion kwhr. In 1938, when the industrial production figure was only 86, our power sales amounted to approximately 45 billion kwhr. In the face of a decrease in industrial production of 34 points, our industry has increased its power sales nearly 5 per cent, which would seem to indicate that the process of electrifying American industry has been progressing steadily in spite of the depression. In fact, the highly competitive business conditions within manufacturing industries during the past 10 years have been a powerful incentive to purchase more electricity from central stations. There is taking place an enormous increase in the use of electric lighting in factories. Electric welding, heating and air conditioning have greatly increased industrial power sales. In spite of lower cost of, and improvements in, competitive power sources, the electric utilities have continued to expand in extent and volume in the industrial field and there is every reason to believe that this should continue.

Trade relations have received the most considerate attention of electric utilities and this must continue to be the case. In our drive for increased sales of electricity many misunderstandings arise on the part of merchandisers, dealers and others concerned with electrical merchandising because of lack of knowledge of the facts. We should bear in mind that it is difficult for the merchandiser of electrical appliances to understand the load building problems involved from the viewpoint of the utility man. When there is knowledge of the common advantage to be gained, the sales task can more easily be accomplished. Available statistics show that during the past four years electric utilities sold 15 per cent of the total volume of electrical appliance merchandise, and dealers sold 85 per cent of the total.

There never was a time when there was a greater demand on utility salesmen and employees in general for making every contact with the customer a friendly one. Customer relations are a most important factor in our business and I believe have never been receiving more intelligent attention from electric utilities than at present.

Adequate Wiring

The need for more adequate wiring continues to be one of the serious obstacles to the greater use of electric service. New wiring products and methods, which constitute a big improvement over previous materials and methods, have been developed and have been widely tested, but the application of these necessarily depends upon their careful appraisal and approval by code making bodies, insurance interests and city and state authorities. The Edison Electric Institute has made a number of specific proposals looking toward the approval in the Electrical Code of these improved materials and methods and their widespread application. A large volume of data has been assembled to prove their safety and practicability, and publications have been and are being prepared showing their application in actual commercial establishments, factories, residences and other types of buildings. These proposals were submitted last year to the Electrical Committee, which formulates

and revises the National Electrical Code, and are receiving the careful consideration of its several sub-committees. At the meeting of the main committee in December of this year their adoption into the Code will be voted upon.

Many informal conferences have been held with representatives of other organizations concerned with the National Electrical Code to show not only how these proposals will result in better and less expensive wiring but how they may be expected to result in increased business and employment to all branches of the industry.

The present state of inadequate wiring, it is obvious, can only be corrected through the concerted sales effort of all interested in this industry. The object is to get much more copper and many more outlets in all types of buildings. Considerable has been accomplished already through the stimulus of the Adequate Wiring Program of the National Electrical Manufacturers Association. It is important that electric utilities generally should give this project their strong support. As fast as new materials and methods can be taken advantage of they should redouble their efforts to sell much more electric wiring and thus break down this old barrier to the greater use of electric service. The proposed code changes represent practical means for the benefit of the customer and of all branches of the industry. They should be put to use to increase radically the conducting capacity of electric wiring in existing buildings and, of course, in new ones also. They should help materially to solve the wiring problem for years to come.

Technical Advances

Within recent years, as in earlier years, the engineering field of design and operation has witnessed many advances in technology, some fully realized, others being tried out in practice, while still other technical developments await translation into the form of reliable practical apparatus. If time permitted, considerable space might profitably be devoted to this interesting period in the life history of technical apparatus, namely, the period between the appearance in practical form of a new development in technical equipment and its ultimate availability as a thoroughly dependable product, the weak spots of which have been made strong and all the kinks ironed out.

Among the advances in recent years are the more general availability of 3600 r.p.m. generators in large sizes and the use of hydrogen for cooling. Neither of these developments is strictly new but their wide availability now makes them accepted factors in the design and operation of systems. Recent advances in the study of insulating materials and the study of stresses—electrical and thermal— have already improved the design of equipment and further developments may be expected. It is not unreasonable to suppose that new insulating materials will appear which will still further improve the design and capacity of equipment and of electric systems. Developments in recent years in lightning protection, in interrupting capacity and mechanical reliability of switchgear, in relaying methods and in automatic supervisory apparatus have made important contributions toward improving system capacity and reliability.

The important point to observe is that technical advances are continuing unabated. The engineers of the laboratories and the engineering staffs of manufacturing establishments, as well as the engineers of power systems, are still producing fruitful results and finding out many things of practical application. For the future welfare of the American people it is most important that the industry should have the financial resources to continue to translate these technical advances promptly into improved and cheaper electric service to the public.

An important development of the past five years has been the steady replacement of old equipment and the salvage through modernization of many of our older power stations. Even allowing for differences of reporting and classification fixed electric capital, as reported by the Bureau of the Census, showed no increase during the five-year period 1932 to 1937, notwithstanding the expenditure for construction by private utility companies during that period of some $1,150,000,000. That this is bearing fruit is shown by the fact that, although the output of electricity by fuels increased between 1930 and 1938 by some 9 billion kwhr, or nearly 15 per cent, the amount of fuel used in the two years was identical. Most of the funds which have been required for these construction budgets have been made available through the annual charges for depreciation and from other current sources, including some diversion from the stockholders' divisible profits. Even in 1938, while total financing by our operating companies amounted to some $954,000,000, less than one-sixth of this represented new money from the sale of securities.

Dependability of Service

The most extensive and costly disaster in our history, from the standpoint of number of electric customers affected, occurred in New England and eastern New York during the past year, when a tropical hurricane with little warning struck that territory. Sea water flooded a number of generating stations, some sections of transmission line were blown down, but the principal damage was to distribution circuits. In an area whose streets and highways were lined with trees, this was bound to happen. Underground circuits near sea level were interrupted because of flooding.

In restoring electric service in the vast stricken area, a splendid manifestation of alert and capable enterprise was witnessed. Augmenting the efforts of the local organizations were line crews from companies all over the Atlantic and East Central States, which were rushed to the aid of utility companies and municipal utilities to help restore service in the region. The task was rendered more difficult by blocked highways and the general disruption occasioned by the disaster.

Wind, ice and lightning storms, floods and fires from time to time menace electric service. The problems so presented are under constant study by the engineers of our systems and by those of electrical manufacturing companies, and great strides have been made in improving the reliability of service. Today electricity is sold from transmission systems to industries where interruption of power for a few seconds or minutes may involve serious factory shutdowns and losses. Great increases in the magnitude of systems, in the volume of power handled and changes in the character of electric loads, alter conditions so that study and redesign are necessary from time to time in order to maintain and improve reasonable standards of reliability.

To keep up with these changes and to advance the art requires a constant expenditure of funds and therefore adequate earnings are required in order that reliability will be properly safeguarded in future. In striving for a high degree of reliability, however, good engineering and good management must determine reasonable limits; striving to increase insurance against interruption from 99.9

(*Continued on page* 287)

C. W. Kellogg Becomes Salaried President; H. S. Bennion Elected Managing Director

Mr. Kellogg, who becomes the Institute's full-time salaried chief executive officer

CHARLES W. KELLOGG, who has served as president of the Edison Electric Institute for the past three years, has retired from the chairmanship of the Engineers Public Service Company to become the full-time salaried president of the Institute. Formal announcement of his new status was made at the closing session of the convention. Announcement was also made that the board of trustees had elected Major Howard S. Bennion to the post of vice-president and managing director to succeed Bernard F. Weadock, whose retirement to resume the practice of law is noted elsewhere.

F. H. Nickerson, vice-president of Consolidated Edison Co. of New York, Inc., was re-elected treasurer of the Institute and Miss Mae B. Woods was re-elected secretary. Vice-presidents re-elected were: Paul M. Downing, vice-president, Pacific Gas and Electric Company; A. H. Kehoe, vice-president, Consolidated Edison Company of New York, Inc.; J. E. Davidson, president, Nebraska Power Company and W. E. Mitchell, vice-president, Georgia Power Company.

All members of the board of trustees whose term expired this year were re-elected for another three-year period. They are: James B. Black, Pacific Gas and Electric Co., San Francisco, Cal.; James F. Fogarty, The North American Company, New York, N. Y.; C. W. Kellogg, Edison Electric Institute, New York; B. W. Lynch, Standard Gas and Electric Company, New York; A. C. Marshall, The Detroit Edison Company, Detroit; Thomas N. McCarter, Public Service Electric and Gas Company, Newark, N. J.; H. Hobart Porter, American Water Works and Electric Company, Inc., New York; Herbert A. Wagner, Consolidated Gas, Electric Light and Power Company of Baltimore, Baltimore, Md., and Wendell L. Willkie, The Commonwealth and Southern Corporation, New York.

Mr. Kellogg has devoted his entire business career to the public utility industry. He has served, since his graduation from the Massachusetts Institute of Technology in 1903, with Stone and Webster or affiliated organizations.

Since 1934, and until his resignation on May 25th, he was chairman of the board of Engineers Public Service Company. Previously he had served as president of Engineers Public Service since shortly after its formation in 1925.

Mr. Kellogg was born in Philadelphia, Feb. 27, 1880. He received his B.S. degree at Massachusetts Institute of Technology in 1902, earning his Master's degree in Science in 1903. After graduation he began work with Stone and Webster, becoming manager of the Edison Company of Brockton, Mass., in 1905. Subsequently he spent nine years in Texas, at various times serving as manager of the electric light and power properties in El Paso and in the Gulf Coast region, as well as manager for several years of the Texas Securities Department.

His experience in operating utility properties was further enhanced by service at Keokuk, Iowa, where from 1914 to 1919, he was manager of the Mississippi River Power Company (The Keokuk Dam). During the latter two years he was also manager of the Middle West District for Stone and Webster. He turned to the East in 1919, and for the next six years was located at the Boston office of Stone and Webster, being engaged in expert work on reports, appraisals, etc., including work for the Interborough Rapid Transit Company of New York, and the Conowingo project on the Susquehanna River. In this period also, he had charge of organizing and conducting local securities sales campaigns for operating companies.

Major Bennion, who succeeds Mr. Weadock as vice-president and managing director

Since coming to New York in 1925 he has won recognition throughout the industry for his exceptional qualifications in utility leadership, both in matters of administration and policy.

Major Bennion, who succeeds Mr. Weadock, has been Assistant Managing Director of the Institute since it was organized. A native of Utah, he was graduated from the United States Military Academy at West Point in 1912, from the Army Engineers' School at Washington in 1915. He served as chief of the A.E.F. Camouflage Service in France during the World War, and later as executive officer for the chief engineer A.E.F.

Returning home in 1919 with decorations including the Distinguished Service Medal, the Legion of Honor of France and the Cross of Valor of Poland, he became assistant chief engineer of the Federal Power Commission from 1920 to 1924, district engineer in charge of flood-control work on the lower Mississippi River Spillway Board in 1924-1926, and joined the former National Electric Light Association in 1926 as Director of Engineering.

The Outlook for the Electric Utilities

By Floyd L. Carlisle

Chairman of the Board, Consolidated Edison Company of New York, Inc., New York, N. Y.

An address before the First General Session of the Seventh Annual Convention of the Edison Electric Institute, New York, N. Y., June 6th, 1939.

IT is my pleasant duty on behalf of the Consolidated Edison Company of New York, Inc., and its subsidiaries to welcome the delegates to this Convention here. It has been many years since New York has had the high privilege of acting as host to the trade association of the electric industry. New York is never at any time modest in asserting its superiority as a convention city, but realizes that the convention is held here this year because also of the World's Fair. When you visit it, you will realize that it is an effort to portray the progress of man up to the present time in all phases of his activities and to make reasonable prophecies of the future. It will need no language of mine to dramatize for you the importance of electricity in this great exhibition. It has become the super-tool of the machine age and practically everything at the Fair receives its life from the use of electricity.

To me the Fair is the newest way to express ideas. The buildings, paintings, sculpture and exhibits are, of course, of outstanding artistic beauty, but that is outside of the scope of my subject this morning. The Fair may be divided roughly into three parts: Government exhibits, American private industry exhibits and amusements. On the latter I will not dwell because you are about to participate in them and they will be a happy background to the serious part of the Fair.

There are many impressions that you will carry away, but to me, after almost daily contact and attendance, the outstanding fact is the head-on clash between the varying shades of expression of the totalitarian Governments and the exhibits of American private industry. What I may say in reference to any foreign Government exhibit assumes and respects its every right to adopt the form of government which they choose and to freely show their ideas to America. The Russian exhibit is the extreme expression of the absolute and total domination of all means of production and distribution by Government. I say it is the complete opposite of everything that the American economic system, with its Constitution and laws, has heretofore given expression to. In between are varying shades of authoritarian states and many quite similar to our own in their economic concepts. It is a magnificent presentation that most of the major countries of the world are making and it is a great challenge in these stirring times. It is truly an international exposition and almost no shade or color of government or economic life anywhere in the world is omitted. In the long run, whatever economic order best serves the people of any particular country will prevail, and I for one feel immensely proud of the part played by American private industry in the World's Fair and particularly our industry there. American business, big and little, is on parade.

MR. CARLISLE

Lines form at the opening of the Fair every morning to gain admittance to many of our great corporations' buildings. In the case of the Consolidated Edison Company, whose building I hope you will visit, we assumed that if 2,000,000 people attended our exhibit, its advertising value would be justified. During the month of May, we had over 800,000 and it looks now as if four and a half million will be the minimum of attendance.

The American people are intensely interested in what American private initiative has done. Research, invention, mass production, efficiency and quality are displayed in buildings of great beauty. The exhibits within visualize with dynamic impact the American economic machine. The unique contribution of American private business in the last 50 years has been the development of the mass production industries and the enormous growth in the consumption of goods and services. The statistics have been many times published, showing that the average American has doubled the buying power in goods and services for an hour's labor of work of the next most fortunate country, and many times the average of most of the peoples of Europe. The rest of the world has sought to copy the methods of American business, and while they have not applied them to the same governmental concepts, they have nevertheless everywhere sought to duplicate them with the expectation of improving living standards of their people. The tremendous lift in the standards of living as a result of our particular type of industrial expansion, was primarily due to the ability and character of the men who directed American industry during the last 50 years. Labor, the investor, the laws of the country, all contributed very greatly, but the achievements would never have occurred without the genius of the men who invented, who soundly planned, who conservatively financed and operated this economy.

I wish that every citizen in the United States could attend the Fair

and see with his own eyes this dramatic presentation of our economic order. It is not in speeches, not even in charts, but in beautiful buildings and dioramas, in pictures and animated turntables, in pageants, in blank verse, in music, that American business is telling the story.

In discussing the outlook for the electric utilities it is dangerous for anyone to be dogmatic. Our industry has been one of the few leading industries in the country that has increased its output during the depression and has shown ability to adjust itself to changing conditions. The electric industry is so interwoven with the life of the total population and the whole manufacturing and industrial economy that it can not permanently prosper except as the whole country prospers.

In reviewing the general situation in America, I cannot but contrast it with that of the other leading industrial nations of the world. Unlike England, Germany, Italy and Japan, this country raises practically all of the food necessary to support it and it requires the labor of only 20 per cent of our population to do so. Here also there is abundant land and resources upon which to support a much larger population, and the crowding and pressure that exist in many European countries are entirely absent here. We, further, possess more than half of the world's gold which is available for purchase of raw materials and commodities which may be necessary for our prosperity. Most of the rest of the countries of the world are unable to use gold as a means of purchasing raw materials, and are now practically on a barter basis. All of the major European countries are, furthermore, employing a considerable percentage of their people in manufacturing implements of war. Our geographic location, fortunately, guards us from this great menace. The people of America are certainly in a far more favorable situation to live at peace and to enjoy abundance than those of any other country. Our internal situation is, of course, tremendously affected by the long continued unemployment of large numbers of our people, and it is with the solution of this problem that we are most concerned. In 1936 and 1937 the production of goods and services greatly increased from the low point of 1932 and 1933, and gave promise of holding. The decline in late 1937 and in 1938 has been difficult for us to understand, and to analyze its causes is by no means a simple task.

I have always personally felt that the decline of production following 1929 was primarily due to the great confusion following the World War. The World War greatly stimulated the production and consumption of all classes of goods and services, and its ending was followed by a period of diminished turnover. This in turn was followed by a period of abnormal activity and then by the big depression. The depression was the result of the breakdown of international credit, necessitating a world-wide readjustment of currency values and debts. Its effect was a tremendous drop in the volume of goods and services. An era of intensive nationalism set in and barrier after barrier of tariffs, trade restrictions and currency limitations were set up. For many decades prior to the World War the leading industrial nations adjusted the difference between their exports and imports by loans on currencies based upon gold. Japan, Germany, and Italy were always able to borrow from creditor nations sums sufficient to stabilize their currencies and to deal freely with each other. Great Britain, France, Holland and Belgium were the leading creditor nations of the world and were accustomed to invest their surplus with the debtor countries of the world. The World War changed all this relationship, and the United States became in a very short period of time no longer a debtor but the leading creditor nation of the world. Whatever may be the cause, the plain stark truth of the matter is that the international trade has gone back very largely to a barter basis, and international credits such as are necessary for a peaceful world have almost ceased to exist. There can be no lasting peace in the world, and economic advancement and security, until gold becomes again the standard by which currencies are valued, and the leading nations possess gold in reserves sufficient to service their trade. Whether we like it or not, this country must at some time take the lead in this movement. Hitlerism in Germany, and personal governments in the world will end only when the economic process permits the great nations of the world to again freely trade with each other on a modern, civilized basis.

In discussing our domestic situation, the question pressing for solution is, how private industry can employ all of the people able and willing to work. Blind, unreasoning criticisms of governmental policies will not cure the situation. Intolerance of any point of view is not conducive to a solution of difficulties. Our American private economy today is giving work to at least 43 million of our people, but is unable for the moment to employ about 10 million. Some of these 10 million are perhaps unemployables. They must in some way be supported out of the national economy.

Our national turnover in the year 1939 is assumed to be approximately 65 billion dollars. An increase of this amount to 80 billion dollars, it is said, will end unemployment. Our whole governmental structure and the maintenance of the 43 million people gainfully employed come solely from the working of our private ownership of commerce. The salaries of government employees, the Army and Navy, the courts, P.W.A., W.P.A. and other government activities are only possible as taxes to be levied now or in the future can be taken out of the turnover of business. Wages, interest, dividends, come solely from these sources. There is, furthermore, ever present the tremendous desire on the part of everyone to purchase more goods and services. The American consumer has been sold the value of American commodities. Increased production of commodities creates buying power. Buying power cannot be created merely by creating more currency or bank deposits. If that were true, the volume of production could be raised to any limit by simply printing money. The automotive industry is a classic example of the production process creating its own buying power.

When private industry expands, it is through reserves or earnings or new capital issues. Such expansion automatically creates wealth and buying power. There are many intangible things that have to do with this. There has to be a hopeful outlook by the people towards the future. The manufacturer who buys new machinery and markets a new product has got to have some confidence that his product will sell and that he will realize a profit.

The fear of a European war and our possible involvement in it has undoubtedly played a considerable part in holding back increased production. There is a further widespread fear that we never can stop our present government deficit financing. In my judgment, after nine years of unbalanced Federal budget, the surest thing to return prosperity is to determine at some time, in the not too distant future, to end this condition. It

is, of course, quite possible to do this. It is to be hoped that private business can reabsorb the unemployed as the government lessens its expenditures for this purpose. A definite, certain program would, in my judgment, greatly restore confidence and lead to business expansion. Even if there is no exact certainty as to the ability of business to absorb the unemployed, the failure to end deficit financing would be even more tragic. All our high grade securities, inincluding government bonds, and the value of our currency, would be destroyed if we were permanently on a basis of issuing debt in excess of income.

I do not for a moment believe that private industry cannot absorb our unemployed. I base my judgment partly on the picture as I see it in the City of New York. Since 1930, with the exception of a few ventures like Rockefeller Center, like the slum clearances and low-cost housing, and with the further exception of government expenditures for roads, parks, school houses, tunnels, bridges, etc., there has been no building by private capital. New York is the largest manufacturing city in the world, but for nine years there has been very little new machinery bought here. Many buildings have been torn down to ease the tax burden. I recently made a trip around the waterfront of New York where many of our manufacturing establishments exist, and I am certain that with an upturn of production, great modernization will occur. Every man in business is anxious to make money. The profit urge is ever here. New York City has always grown by fits and starts. It will take ever so little for New York to resume its own upward spiral of expansion.

In looking at our own business, the investor is more fearful of government competition than anything else. There are some people who believe that the public utilities are certain to be taken over by government. I do not share this view. It would require at least 15 billion dollars of new government financing, federal, state and municipal, to take over the electric power business either by purchase or by duplication. Certainly no government that believes in the preservation of American private economy would attempt this program because it would mean such an enormous increase in government debt that it would affect the market value of all existing government bonds, render much more difficult future government financing, to say nothing of throwing a further enormous burden of taxation on all other business.

To preserve our American private capital economy, it will be absolutely necessary, some time within at least two or three years, to end further government bond issues and to find ways and means of slowly reducing the principal of those outstanding. I wish there was an exhibit at the World's Fair, something like this: underneath would be the farms, factories, houses, stores, banks, insurance companies, railroads, public utilities, etc., supporting and maintaining governments. This exhibit would dramatize the fact that only out of the prosperous production and distribution can government activities be maintained. If this cannot be done in the United States, then our whole economy must change, and there are various exhibits at the World's Fair that you can look at showing the other economies.

For more than 30 years the electric utilities of this country have in most instances been regulated by the States. We have been able to grow and prosper under such regulation, and there has been a tremendous expansion in the use of our services under it. The electric utilities can use every year large amounts of additional capital. They have demonstrated their ability to expend during the depression years. In the City of New York, since 1930, we have increased our output of kwhrs 50 per cent.

Gas and steam and telephone utilities can likewise provide additional investments that will in turn relieve unemployment. The vacuum in new and more modern machinery as a result of the depression constitutes an enormous field for private expansion. All of us, I assume, want growth in our business. Our present load curves reflect increasing production. When you see the research laboratories of the electrical manufacturing companies and of other progressive industries, the new lighting effects, the almost complete air conditioning of the buildings at the Fair, your only concern will really be as to how to meet the growth that the exhibit portends.

Our industry was started a little over 50 years ago with an idea and has become one of the largest industries in America. It was built up by men of great inventive genius, courage, flexibility, capacity to meet and adapt progressive changes—salesmen of service. There have been far more difficult times in the past for this industry than exist today. We have found in New York that it is possible to increase the sale of appliances on a scale greater than before the depression. We are essentially merchants of service. If all industries of the United States had the ability to expand their services like our industry has done, there would be no depression and no unemployment. In fact, our industry has actually increased its output in a greater proportion than almost any other. Greater volume at lower prices is the formula which has built up American business.

The confidence in the future of the American private ownership economy is overwhelmingly expressed in the Fair. One hundred fifty-five million dollars has been expended to put on a magnificent international exhibition at a time of great depression to show the American economy to the whole world. The new products of laboratories mean more efficient machinery, better houses, better clothes, cleaner and more nourishing food products, more modern transportation in the air, on the railroads and on highways, television, air conditioning, more modern equipment for the farm. There are enough new things shown at the Fair to keep America busy manufacturing and selling them to the American people.

The President's Report

(*Continued from page* 283)

per cent to the full 100 per cent might represent excessive and unjustifiable expense.

I should like to close on a note of moderate optimism but also with a warning. The results of the past year have confirmed the long established reputation of our industry for relative stability compared to other lines of business and it is therefore encouraging to find ourselves no worse off than we are after six years of attack by the government of the most powerful nation on earth, backed by a correspondingly rich treasury and correspondingly pervasive propaganda. We must never forget, however, that, more important than all of these for our future welfare, is what our 27,000,000 customers think about us and about the sort of job we have done in the public service. During all these years that public has had to face so many and pressing problems of its own that we cannot ask or expect from them special sympathy with us in our specific troubles. They will size us up solely on the efficiency and dependability of our service and on the way we conduct ourselves in our daily relations with them and as citizens in their community. In my opinion it is the degree to which we have satisfied these our service obligations that has brought us to the present day still a strong, stable industry. It remains only to remind you, therefore, that our salvation is largely in our own hands. With our past achievements and with the resolve to do even better in future, I believe that we can and will work out that salvation.

Wisconsin Electric Power Company Wins Coffin Award

THE CHARLES A. COFFIN *Medal, comprising a Gold Medal, a Certificate of Achievement, and $1,000 in cash for the winning company's employee's benefit fund, has been awarded the Wisconsin Electric Power Company, Milwaukee, for its outstanding achievement in the promotion of electric service and operation of its system. Presentation of the award was made at the Institute's Convention, June 8, by Gerard Swope, General Electric Company, to S. B. Way, president of the Wisconsin company. Mr. Liversidge, in announcing the award, said:*

"THE Prize Awards Committee administers the Charles A. Coffin Award (in addition to the awards discussed elsewhere) and it is now my privilege to announce the winner of the 1938 award. This award, established in 1922 by the General Electric Company as a tribute to the memory of the late Charles A. Coffin, founder of that company and one of the great leaders in the electrical industry, each year goes to that company which has made a distinguished contribution to the development of the electric light and power industry for the convenience of the public and the benefit of the industry. The winning of this award is considered a very great honor and distinction and it is deservedly the most highly prized award for which electric utilities can compete.

"The committee of judges this year were confronted with an unusually difficult task because of the excellence of the exhibits submitted for the award and the strong claims which each of the six contesting companies was able to put forward to warrant its selection as the winner. In reviewing the presentations the judges have been deeply impressed with the splendid evidence of diligent and capable efforts to bring about improvements in service and to contribute benefits both to the public and to the industry. It gives me pleasure to announce the unanimous decision of the judges consisting of Dr. Karl T. Compton, president of Massachusetts Institute of Technology; Mr. A. C. Marshall, vice-president and general manager of the Detroit Edison Company, and your chairman of the Prize Awards Committee, which for outstanding accomplishments during the year 1938 awards the Charles A. Coffin Medal to the Wisconsin Electric Power Company. This company has made distinguished contributions to the technical development of this industry in efficiency, power generation and in power sales to the public.

"In 1938 the Wisconsin Electric Power Company's combined generating plants produced electric energy at the remarkably low yearly average of 13,677 B.t.u.'s per kwhr, and the yearly average for its low cost Port Washington generating station was only 10,788 B.t.u.'s per kwhr, a world's record for this class of station.

"Efficiency in handling customers' accounts, from meter reading to collecting, has enabled the company to reduce the cost per bill to a remarkably low level. The company's record in the sale of power for industrial, commercial, domestic and rural purposes is outstanding. It has achieved most effective and satisfactory cooperation with dealers in electrical merchandise.

"The company has established good relations with the public. It has built up good employee relations and placed them on a sound basis. It has achieved an excellent safety record with no fatal accidents in a period of five years.

"In 1936 the company effected a reorganization and refinancing which has placed it in a strong financial position and materially reduced its fixed charges.

"The public which this company serves has benefited greatly and will continue to benefit from its achievements. The industry likewise has benefited and will continue to do so."

Left to right: Gerard B. Swope, president, General Electric Company, representing the donor of the Charles A. Coffin Award; S. B. Way, president, Wisconsin Electric Power Company, winner of the award, and H. P. Liversidge, chairman of the Institute's Prize Awards Committee.

Report of the Prize Awards Committee

By H. P. Liversidge
Chairman, Prize Awards Committee, Edison Electric Institute

Presented at the Third General Session of the Seventh Annual Convention of the Edison Electric Institute, New York, June 8, 1939

THE Prize Awards Committee, consisting of the president of the Institute, Mr. C. W. Kellogg; Mr. James E. Davidson, president of Nebraska Power Company, and your chairman, is charged with administering various prizes open to competition by electric utilities in the United States or their employees. The committee administers the Charles A. Coffin Award for distinguished contribution to the development of the electric light and power industry, the Augustus D. Curtis Award for illumination of commercial and public buildings, the George A. Hughes Award in the field of domestic electric cookery, and the Thomas W. Martin Award in the field of rural electrification. It administers also the B. C. Forbes Prize for the best paper on public relations, the James H. McGraw Prizes for the three best papers on engineering, the R. B. Marshall Award for achievement in electric range sales, the Claude L. Matthews Valor Awards, and it has been asked to make the presentation of the award of the National Electric Water Heating Council.

Edison Electric Institute Medal

The Prize Awards Committee is also charged with the administration of the Edison Electric Institute Medal, which is awarded in recognition of the successful resuscitation by the prone pressure method of individuals suffering from electric shock. There have been 13 Institute medals awarded to employees of electric utilities for saving of lives since the announcement made at last year's convention. The total number since the inception of the medal in January, 1933, is 80 medals. The committee of judges awarding this medal are Mr. Wills Maclachlan, chairman; Mr. W. R. Smith, Mr. C. R. Beardsley and Miss M. B. Woods, secretary.

B. C. Forbes Prize

A cash award of $250 is donated by Mr. B. C. Forbes, editor of *Forbes Magazine*, for the most meritorious paper dealing with the subject of public relations in the electric light and power industry.

MR. LIVERSIDGE

The judges for this award, Mr. D. C. Green, president, Central Service Corporation; Mr. G. W. Van Derzee, vice-president and general manager of Wisconsin Electric Power Company, and Mr. T. D. Crocker, vice-president of Northern States Power Company, have awarded the prize to Mr. A. W. Conover, vice-president and general manager of Central Ohio Light and Power Company, for his paper entitled "Public Relations."

The judges awarded Honorable Mention to Mr. B. J. George of Kansas City Power & Light Company, for his paper entitled "Our Employees: They Can Make or Break Our Public Relations," and to Mr. Leonard Lathrop of Jersey Central Power and Light Company, for his paper entitled "Management and Public Relations."

James H. McGraw Prizes

Three cash prizes, one of $250, one of $150 and one of $100 are donated by

James H. McGraw Prize Awards Winners: St. George T. Arnold, F. R. Ford, S. B. Williams (who presented the prizes in behalf of Mr. McGraw), A. H. Kidder, H. H. Johnson and M. S. Umbenhauer.

B. C. Forbes, donor of the Forbes Prize and A. W. Conover, vice-president, Central Ohio Light and Power Company, Findlay, Ohio, winner of the award. Mr. Conover's paper appears in this issue of the BULLETIN

National Electric Water Heating Council Award — Roy Bridges, sales promotion supervisor; W. Marshall Dale, president, Indiana Service Corporation, winners of the award, and A. E. Julian, N.E.M.A. Water Heating Section

Kenneth DeLate, Idaho Power Company, Pocatello, Idaho, winner of an R. B. Marshall Award, is congratulated by H. L. Martin, manager of The Modern Kitchen Bureau

Horace P. Liversidge, chairman, Prize Awards Committee, and Charles A. Primeau, Wisconsin Electric Power Company, winner of an R. B. Marshall Award

Augustus D. Curtis Awards—Kenneth Curtis, one of the two donors; H. L. McKinley, second prize winner; S. H. Johnson, who received third prize; M. H. Skinner, representing his company, Buffalo, Niagara and Eastern Power Corp., winner of the Curtis first prize, and Darwin Curtis, second of the two donors of the award

Mr. James H. McGraw, honorary chairman of McGraw-Hill Publishing Company, for the three most meritorious papers on any engineering or technical subject relating to the electric light and power industry.

The judges of this award, consisting of Mr. H. R. Woodrow, vice-president of Consolidated Edison Company of New York, Inc.; Mr. W. A. Shoudy of Orrok, Myers and Shoudy, consulting engineers, and Mr. F. R. Innes of *Electrical World,* have awarded the first prize to Messrs. A. H. Kidder and F. R. Ford of the Philadelphia Electric Company for their paper entitled "Increased Loading of Apparatus and Lines Permits Practical Economies." The second prize is awarded to Messrs. H. H. Johnson and M. S. Umbenhauer of Consolidated Edison Company of New York for their paper entitled "An Effective Load Dividing Device—Makes Economic Division of Power Generation Simple, Rapid and Economical." The third prize is awarded to Mr. St. George T. Arnold of Boston Edison Company for his paper entitled "Some Principles and Practices of Modern Distribution Design—Suburban Load Densities."

R. B. Marshall Award

A cash award of $500, divided into five equal parts of $100 each, is offered by Mr. R. B. Marshall, president of Electromaster, Inc., to the utility representatives who, during the calendar year 1938, sold, leased or rented the greatest number of individual domestic electric ranges of a rated capacity of 5 kw or more. The terms of the award provide that the salesman must be employed by a utility company for at least six months and must be an employee at the close of the contest year. Utilities are divided into five classifications according to the number of domestic customers served, and a prize is offered in each classification.

The judges of this award, Mr. F. E. Watts, vice-president of Bennett-Watts-Haywood Company; Mr. L. E. Moffatt, editor of *Electrical Merchandising,* and Mr. Howard F. Weeks, president of the Public Utilities Advertising Association, have announced the following prize winners:

In Group One, serving up to 25,000 domestic customers, there were no entries.

In Group Two, serving 25,000 to 50,000 domestic customers, Mr. K. F. DeLate of the Idaho Power Company, Pocatello, Ida., is the winner.

In Group Three, 50,000 to 100,000 domestic customers, Mr. Denson L.

Howard Sharp, Buffalo, Niagara and Eastern Power Corporation, winner of the Cash Award accompanying the Curtis first prize

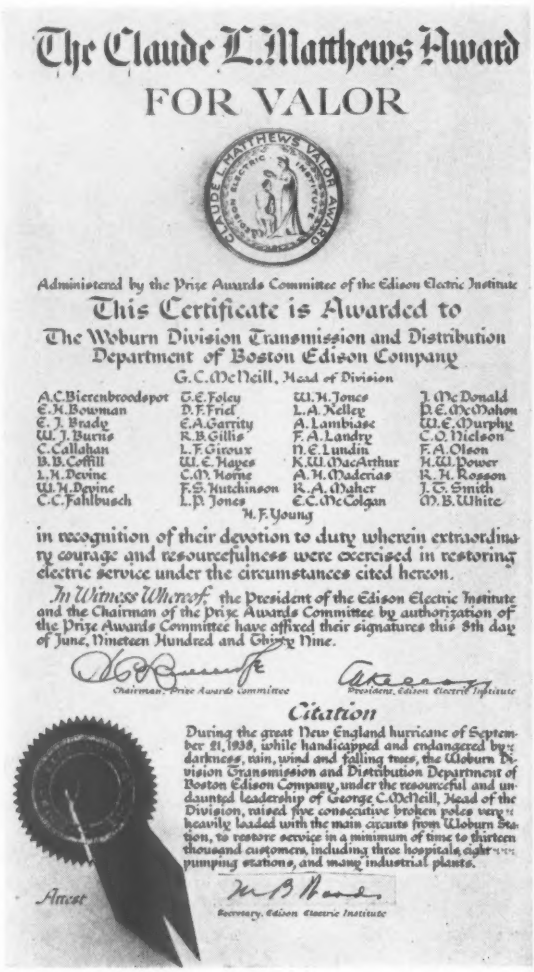
Denson L. Satterfield, Alabama Power Company, winner of an R. B. Marshall Award, is shown with his son

Robert J. Burgh, Detroit Edison Company, winner of an R. B. Marshall Award

FOR VALOR

On the right is reproduced the Claude L. Matthews Award for Valor Certificate, the first to be awarded. G. C. McNeill, leader of the Boston Edison, Woburn Division, T. & D. Department, to whom the Award was made at the Convention, is shown above with Claude L. Matthews, donor of the Award. The Division is shown below.

The Division has unanimously voted to present the cash prize accompanying the award to one of its members who has had serious illness in his family.



The Claude L. Matthews Award

FOR VALOR

Administered by the Prize Awards Committee of the Edison Electric Institute

This Certificate is Awarded to

The Woburn Division Transmission and Distribution Department of Boston Edison Company

G. C. McNeill, Head of Division

A. C. Bierenbroodspot	T. E. Foley	W. H. Jones	J. McDonald
E. H. Bowman	D. F. Friel	L. A. Kelley	D. E. McMahon
E. J. Brady	E. A. Garrity	A. Lambiase	W. E. Murphy
W. J. Burns	R. B. Gillis	F. A. Landry	C. O. Nielson
C. Callahan	L. F. Giroux	N. E. Lundin	F. A. Olson
B. B. Coffill	W. E. Hayes	K. W. MacArthur	H. W. Power
L. N. Devine	C. V. Horne	A. H. Maderias	R. H. Rosson
W. H. Devine	F. S. Hutchinson	R. A. Maher	J. G. Smith
C. C. Fahlbusch	L. P. Jones	E. C. McColgan	M. B. White

H. F. Young

in recognition of their devotion to duty wherein extraordinary courage and resourcefulness were exercised in restoring electric service under the circumstances cited hereon.

In Witness Whereof, the President of the Edison Electric Institute and the Chairman of the Prize Awards Committee by authorization of the Prize Awards Committee have affixed their signatures this 8th day of June, Nineteen Hundred and Thirty Nine.

Chairman, Prize Awards Committee

President, Edison Electric Institute

Citation

During the great New England hurricane of September 21, 1938, while handicapped and endangered by darkness, rain, wind and falling trees, the Woburn Division Transmission and Distribution Department of Boston Edison Company, under the resourceful and undaunted leadership of George C. McNeill, Head of the Division, raised five consecutive broken poles were heavily loaded with the main circuits from Woburn Station, to restore service in a minimum of time to thirteen thousand customers, including three hospitals, eight pumping stations, and many industrial plants.

Attest

Secretary, Edison Electric Institute

Satterfield of Alabama Power Company, Tuscaloosa, Ala., is the winner.

In Group Four, 100,000 to 250,000 domestic customers, Mr. Charles A. Primeau of Wisconsin Electric Power Company, Milwaukee, Wis., is the winner.

In Group Five, serving over 250,000 domestic customers, Mr. Robert J. Burgh of the Detroit Edison Company is the winner.

Claude L. Matthews Award for Valor

Three cash awards, each of $150, are offered by Mr. Claude L. Matthews, vice-president of W. N. Matthews Corporation, for acts of devotion to duty wherein extraordinary courage has been exercised to maintain important electric service or to restore service in the shortest possible time.

The judges of this award, Mr. C. R. Beardsley of the Consolidated Edison Company of New York, chairman; Mr. N. M. Argabrite, American Gas and Electric Company, and Mr. A. E. Silver, Ebasco Services Incorporated, have awarded a cash prize of $150 to the Woburn Division, Transmission and Distribution Department of the Boston Edison Company, of which Mr. George C. McNeill is head. The judges' citation of the Woburn Division reads as follows:

"During the great New England hurricane of Sept. 21, 1938, while handicapped and endangered by darkness, rain, wind and falling trees, the Woburn Division of Boston Edison Company, under the resourceful and undaunted leadership of George C. McNeill, head of the division, raised five consecutive broken poles very heavily loaded with the main circuits from Woburn station, to restore service in a minimum of time to 13,000 customers, including three hospitals, eight pumping stations, and many industrial plants."

A certificate containing the citation to the division and a button to each of the individuals in the group accompany the award.

Only one entry was received for the Matthews Valor Award. This was the first year the award was available, which probably accounts for the lack of entries. It is the hope of your Prize Award Committee that company executives will be alert to the opportunity this award offers for recognizing courageous acts by their employees in restoring and maintaining electric service. In the operation of this great industry, many such acts must occur in the course of time and it is desirable that they be given the recognition they deserve.

Augustus D. Curtis Award

This is a certificate donated by Messrs. Darwin and Kenneth Curtis of Curtis Lighting, Incorporated, in memory of Augustus D. Curtis, to the public utility operating company in the United States which, during the 12-month period ending March 1, 1939, has shown the greatest contribution to the advancement of artificial illumination of interiors or exteriors of commercial and public buildings, and a cash prize of $300 to the individual or individuals in that company who were responsible for the achievement. A second prize of $200 and a third prize of $100 go to the individual or individuals responsible for the achievement of the companies adjudged second and third in the contest.

The judges, Messrs. D. W. Atwater, president of Illuminating Engineering Society; Otto Teegen, architect, and Dr. O. H. Caldwell, editor of *Electrical Week*, have awarded the first prize to Buffalo, Niagara and Eastern Power Corporation, for its comprehensive program to promote commercial lighting, the development of an organization to carry it through, and excellence in achievements. The certificate is presented to the company and a cash award of $300 to Mr. Howard Sharp as the individual presenting the report.

The second prize is awarded to Georgia Power Company, Atlanta, Ga., for its complete modernization program on school lighting, which won the generous approval of school authorities. Mr. Howard L. McKinley, responsible for the achievement, wins a cash award of $200 as the individual prize.

The third prize is won by Carolina Power and Light Company, Raleigh, N. C., for its cooperation with merchants' associations in various operating centers, which resulted in the marked improvement of the window and interior store lighting in those communities. Mr. S. H. Johnson is the recipient of a check for $100 as the individual responsible for the achievement.

National Electric Water Heating Council Award

To stimulate interest in selling electric water heating service the National Electric Water Heating Council offered this year through The Modern Kitchen Bureau a silver trophy and a $1,000 cash award to the operating utility showing greatest progress in the promotion and sale of electric water heating service in 1938. The Prize Awards Committee has been requested to announce the winner and present the award.

The judges, Dr. Kenneth Dameron, professor of marketing at Ohio State University; Mr. Edgar N. Kobak, vice-president of Lord and Thomas, and Henry G. Dooley, associate editor of *Electrical World*, have awarded the silver trophy and a cash prize of $1,000 to the Indiana Service Corporation, Fort Wayne, Ind.

George A. Hughes and Thomas W. Martin Awards

No entries were received this year for the George A. Hughes and the Thomas W. Martin Awards. Economic conditions were generally less favorable in 1938 than in 1937 and probably no company felt that its performance in the fields of domestic electric cookery and rural electrification measured up to its own performance in preceding years, and because of this fact did not feel inclined to try for the prize. This is an indication of the high standards which the companies set for themselves in competing for these prizes.

The Present Status of Television

(*Continued from page* 297)

with their eyes popping, rubbing their tummies. She flops one out on the plate, they pour maple syrup on it, eat it, and say, "Ain't that good?"

The answer is your mouth starts watering, and you are very likely to turn to your wife and say, "Mary, how about some pancakes tomorrow morning for breakfast?" and when she goes to the grocer, she is likely to point up to that package and say, "Give me a package of that." She has the image of that package well fixed in her mind.

We have tried many types of programs. We believe that television will sell goods better than any other medium that has ever been devised, but that is still years off, and only the future can tell. What we are doing is pioneering. Every day that we put out foot down it is on new ground, ground that men have not trodden before. We are frequently very surprised at the results that we get from our own operations, but television is coming, and I certainly urge all of you to follow its progress with interest, because some day it is going to be a great social force and a great new industry.

The Present Status of Television*

By Lenox R. Lohr
President, National Broadcasting Company

An address before the First General Session of the Seventh Annual Convention of the Edison Electric Institute, New York, N. Y., June 6, 1939

I AM delighted to have this opportunity to tell the members of the Edison Electric Institute something of the newest member of the electrical family, television. This is a precocious infant and, being a precocious infant, is likely to be very troublesome.

The problems of television divide themselves into three major categories. The first of these is technical, the second is programming, and the third is economics. I will touch upon each of these rather briefly and, if possible, try to tie in those phases of television which may be of most interest to the power industry.

There is nothing new about television, and that is despite the fact that just a little over a month ago, on April 30, the National Broadcasting Company went on the air with the first regular public television service.

We have had television for many years, more than ten, and by television I mean the ability to transmit a recognizable image from one point to another, either by air or by wire. However, the problem of modern television is quite different from that of the early days, because now we look upon television as a means of mass entertainment in the home. It is of small general interest how much of a scientific marvel it may be if it does not have a mass appeal, so that in the final analysis we can get a circulation large enough to support fine programs by advertisers. That is the American system of broadcasting as we have developed it for the last fifteen years in sound radio, and we expect that this same American system will work with television.

However, when we say television entertainment, we mean continuous entertainment and entertainment of a high quality, because television is going to have to compete with all the other forms of entertainment. I do not mean only radio nor moving pictures, but I mean the automobile, the magazines, newspapers, and golf. All of these are competing for the little bit of free time which we as human beings have available, and unless it is of high entertainment value, people are not going to forego these other pleasures in life to sit before a television receiver.

MR. LOHR

Early television was mechanical. It required synchronous motors, flying discs, a lot of complication, expense, bulk, and the pictures produced lacked sufficient detail. It was impossible, with these old systems, to pick up an extensive scene. One man's head, or perhaps two, was about all that could be adequately picked up by the little spot of light with which we tried to scan the actual objects that were being televised. In turn, that was put on a very small receiver not much larger than three by four inches, with the aid of a magnifying-glass. Detail was almost entirely lacking. An image was recognizable, there would be no question that you would recognize a friend if he stepped before the televiser, but that was not entertainment. It was only about three years ago, when an all-electronic system was developed with no moving parts whatsoever, except the movement of electric currents or electrons within the set, that it became possible to pick up such scenes as a prize fight, a performance at the Metropolitan Opera House, a baseball game, or a street parade. There is practically no limit today to the scenes which may be picked up. The size of the picture that you receive in the home is still small, but for practical purposes is large enough for the family group.

The form of television that we have devised for the home is designed for an audience of at most eight or ten people —a home group—by which I mean the mother and father and perhaps two or three children, a small group that can crowd up to the receiver. Our pictures are something like eight by ten inches—a picture large enough to show ample detail.

In speaking of the technical phases, I am not going to use technical terms if I can get around it, other than to tell you a little of the problem that we are facing technically.

In order to get the detail necessary for entertainment, something like four or five million separate dots had to be transmitted in a second—that is, each second, four or five million separate dots of light, each varying in intensity according to the light and shadow of the picture, and each having to be at exactly the right spot within that fraction of a second. Now, in order to transmit any such detail, very wide bands of radio frequency were required. Most of you are familiar with the relatively narrow band of sound broadcasting. Ten thousand cycles is a little track in the ether, a very narrow track, set aside for the transmission of a sound broadcast; but, for a television broadcast, because of the great detail, a band six million cycles wide is required and that is not a radio frequency as such. It corresponds to the audio frequency impressed on a carrier wave in ordinary sound broadcasting.

The only point that I want to get

*Transcript of extemporaneous talk.

over is that one television transmitter required six times as much space in the ether as that allocated for all regular broadcasting stations in the United States. Now, in order to find any such width, you obviously must go outside the ordinary band. One of those little, tiny bands may be worth a million dollars. Therefore, it was necessary to go to the ultra high frequencies, that is, wave lengths of less than ten meters. The one we have on the Empire State Building is from forty-four to fifty megacycles.

Five or six years ago no one knew how to build a transmitter of practical power to operate on that frequency, so that is a recent development. Also, we found on those high frequencies the radio waves were subjected to different laws from those that we previously understood, that is, they became quasi-optical and they seemed to obey some of the laws of light traveling in straight lines.

From the top of the Empire State Building where we have our antenna, which, as you know, is the highest building in New York, we have a usable radius of about fifty miles. That is some 8000 square miles. This is not a *small* radius, because most sound broadcasting areas are not that large. It is a mistaken idea that all sound broadcast stations cover very large territories. Of the 700 in the United States, only about 50 will go appreciably farther than that. Whether or not that is a natural law which is line of sight to the horizon, we do not know, but we suspect that it is. The developments in television are so rapid, and so many things which a few days ago seemed impossible are now practical, that perhaps in the years to come transmissions will go much farther. However, that is not of major consequence, because in the years to come we expect television to be networked, that is, many television stations interconnected by some means.

The next technical problem that we ran into was largely one of obsolescence. By obsolescence I do not mean necessarily that the set would not be quite as good as a new set, but, because of the vast complications of television, something like a hundred times as complicated as sound broadcasting, there was the danger that sets would become inoperative in the event of a relatively small change in the transmitter. That is, they correspond to each other like lock and key, and any change in one seems to necessitate a corresponding change in the other. That is totally different from sound broadcasting. You remember the old cat's whisker and crystal and the type of clamped-on earphones. Dig it out today and it will work perfectly well on any modern transmitter. Or, on the other hand, the very earliest of sound broadcast transmitters will work on your present-day radio. That is not true with television, and hence, there was a danger of putting these sets on the market too soon, before we were reasonably certain that we had a system that would stand up for a number of years without freezing the art.

I remember when I first went to Chicago I noticed that the trains on the Northwestern Railroad ran on the left hand side of the track and that seemed rather queer to me. When I asked Mr. Sargent why that was, he said, "Well, you see when this system was laid out back in the '40's or '50's, there were no American engineers available, so we called in a British engineer, and since the trains ran on the lefthand side of the track in England, he laid them out that way here."

I said, "Didn't anyone ever think of turning around and running the other way?"

He said, "Yes, we thought of that, but all switches would point in the opposite direction, all the block signals would be on the wrong side of the track, and all the passenger stations, so we would almost rebuild that road rather than turn those locomotives around."

In other words, they were frozen on the lefthand side. That is our problem in television. It may not be serious with the railroad, but it could be serious if many television sets get out on the market and a new system was developed that would render completely obsolete all the existing sets. That is the reason why it was delayed several years after we felt that technically it was good enough to go to the public.

What the future will be none of us can tell, but we believe we have a good system and one that will stand up over the years. The set technically had to be good enough to be entertaining. It would be of no interest how good the program was if the picture was of the wrong color, if it was not clear, if it was out of focus, if it flickered, if it went off, because any of those things would be irritating.

My own opinion is that television today is technically good enough to go to the public. It is perhaps in the same state that the automobile was in 1910, that is, able to render very good service. I have had a set out at my home in Tarrytown for about three years. It has worked satisfactorily during that entire period, and even as long as three years ago my wife and children operated the set just as easily as they could their sound broadcast receiver. Sets that are coming out now are even simpler than those earlier ones.

So much for the technical side.

The program side is a problem that is not nearly as well solved as the technical. Programming television is going to be a problem which transcends anything we have ever known. We have been programming sound broadcasting for nearly thirteen years, and we think we understand it, but we do not know how to program television. That is despite the fact that we have a corps of something like fifty people who have been experimenting on programming of television for nearly three years. We feel that we have only scratched the surface. We know that unless we can give high-class entertainment and give it many hours a day, we are not going to achieve that mass circulation necessary to the ultimate sale of time on the air. Nor are we going to be able to justify the large price that must be charged for the set unless the entertainment value makes it worth while.

There are certain methods of programming television, which can be stated briefly. The first is motion picture film. Any type of film that we can obtain can be run very cheaply and very satisfactorily through the television transmitter. However, I doubt if we will ever be able to obtain feature films such as are shown in the motion picture theater. They are far too expensive, because we run them once and then from our standpoint they would be forever useless; you could not repeat the show. On the other hand, we could not expect to obtain feature film from the producers because, if we ran it once, then we would kill the box office in all the neighborhood theaters all over the area. If the films are old, then that is just not good television.

So, while the film appears to be an easy solution of the problem, those we have been able to obtain are not of high quality, and I think have caused television to suffer. That is, the people who have seen the films felt that television was not good entertainment and hence they blamed it on television. For that reason, I do not anticipate that for many years, even when television is full grown,

it will compete seriously with the movies. There are many reasons for that, but the particular one is that I do not anticipate that for at least ten years television can afford feature pictures, which is what you go to the movie house to see.

We may have news reels and we may have shorts, and we may have very good ones, as we have learned how to develop them especially for television, but, after all, they are the sideline for the movie audience and not the piece de resistance which is the feature picture.

The other method of programming is live talent in the studios, and that offers far more entertainment possibilities for us. We can do all sorts of things in the studios. Remember, all of these shows are run once and forever destroyed, different from all other forms of entertainment. The actors must memorize their lines instead of reading the script as they do in sound broadcasting; they must have costumes; they must have makeup. Since there are no retakes and no blow-ups, the actors must be perfectly rehearsed in their parts. There cannot be any mistake during the show; they have to go from scene to scene; they cannot take half an hour off for a smoke or rest, but from scene to scene they must move within a few seconds. Frequently, they must change costumes in less than a minute in order to bring them into the next scene at the proper time and in the proper costume. Then we must have sign painters, we must have make-up men and costumers, and all those things that go with it. Something like thirty people are present in a studio to put on a live talent broadcast. We need only four or five to put on a rather elaborate sound broadcast.

However, there are many other forms of live talent that we can use in the studio, a very important one of which in the years to come will be educational. I believe that television is going to offer something to educators that they have never had before. As long as you have a blackboard behind you, which is the television screen, the lecturer can make diagrams, he can put a formula down, all of which is impossible by sound broadcasting. He can actually bring his apparatus from the laboratory and set it up right in front of you and go through all of his laboratory experiments. Since there will be a mass audience, the instructor will be selected for personality as well as ability. I think we all know from our experiences in college and in high schools that some instructors who perhaps had humor and personality and understanding were much better able to put over their subject than others. That is the type, obviously, that would be selected, because he may have a million students in a class. As far as I know, except for the question and answer method, almost anything that can be done in the classroom or in the lecture hall can be reproduced reasonably well and perhaps better in television.

Another reason of pick-up is with mobile units. At present we have two large trucks which carry cameras, synchronizing generators, amplifiers, and a little shortwave radio station to relay the programs into the main transmitter. With that we have picked up baseball games, the first one just a few days ago. We picked up an athletic event over on Randall's Island, where all the various events were transmitted to the audience just as they were happening. A few nights ago we picked up the Max Baer-Lou Nova prizefight. In fact, we carried the preliminaries for two hours. You could see practically every blow that was struck, not as clear as by the moving picture, but certainly clear enough to give a very complete idea of the fight.

Very recently we have found that these programs can be transmitted short distances over telephone wire. I mentioned a moment ago that this is a changing art. We thought for years they could be transmitted only over a very special cable known as coaxial cable, but the telephone company made the experiment and we picked up a bicycle race at Madison Square Garden over the telephone wires and put that program into our studios. We have hopes that we may be able to transmit those programs as much as five miles eventually.

That will not solve the network problem, but it will at least solve the program problem where we will be able to pick up programs in the metropolitan area, such as parades, riots, fire, or anything that may be of interest.

Now, the economic phase of this problem is a very long and difficult one. Our problem is that we must have many thousands, even hundreds of thousands of receivers in the New York area alone before television becomes a competing agency on an economic basis with other forms of advertising, say, sound broadcasting. Well, the price of sets at present ranges between $200 and $600. I suppose in the future, as with all things, these prices will come down. But, in any case, because of that complication, they will be relatively high for many years. Therefore, we must put on good programs in order to persuade people to buy sets, and good programs cost money. The best that we can make out at present is that an hour a day will cost a million dollars a year for programming alone. That does not mean profit or amortization of the overhead expenses. That means if we put on two hours every day, it would cost two million dollars a year; three hours a day, three million dollars a year, and for X years, I do not know how many. As far as the National Broadcasting Company is concerned, that will be entirely an out-of-pocket cost. We are only a programming agency. Other members of the RCA family make sets and transmitters. The National Broadcasting Company is only concerned in programming and operations. So we have that problem of these years of out-of-pocket cost which may be very high.

Our budget for this year on television programming is half a million dollars, which is obviously inadequate for the kind of program service which we would like to do. Undoubtedly, it will have to be increased, but there may be a long period, three, four, five, six, seven, eight years, I do not know, before there will be enough circulation for us to sell our time commercially. Therefore we are going to need all the help we can get, and at any points where the power industry can help us with that, it will be to your own selfish interest to do so. There is no doubt in my mind that television is not only here, but in the years to come it is going to be one of the best cultural, entertainment, and educational features that we have ever had. It is going to have tremendous circulation and, from your standpoint, it consumes considerable energy, nearly a half kilowatt for each receiver, and if there are millions in existence, it will consume far more current than the radio of today, and it will not replace the radio. There are many reasons why sound broadcasting must continue, but the television sets we are now producing have the sound broadcast receiver built right into the same cabinet with television.

The problem of getting the necessary mass circulation, however, is going to be one of networking. At present, there is only one transmitter that is really operating on a program basis, and that is our transmitter on the Empire State Building here in New York. Eventually, there will be transmitters springing up all over the country and, if it were diffi-

cult to program sound broadcast stations, it is going to be far more difficult to program television stations.

The cost of programming will be three or four times as much, and talent, difficult enough to obtain anywhere, is going to be many times as difficult. Therefore, networking is almost essential, because as it was in sound broadcasting the small town, even the middle-sized town, a town of a million people, did not have enough talent to keep that station programmed on a high quality basis hour after hour, day after day.

There is no such thing existing today as a coaxial cable suitable for networking purposes. There is an experimental one from New York to Philadelphia, but a network would involve perhaps ten or fifteen thousand miles of cable stretched across the country and north and south in supplementary lines. It will be many years before that comes in. However, there is coming out of the laboratory now the possibility of ultra high frequency radio relays. Scientists have learned how to take these very high frequencies even higher than those that I mentioned previously, and aim them almost like a rifle, so that a transmitter could have practically all of its energy directed towards another receiving point, say, fifteen or twenty miles away. Since that would be capable of transmitting very wide bands of frequency, far more than a telephone line or even a coaxial cable, by having something like forty or fifty, and perhaps less, of these relay stations we could put television programs into Chicago. If that is true, that will open up the first field for a network, although perhaps actually the first network will go from Boston to Washington, D. C., because, in that leg on the eastern coast, there is that very high concentration of population in a relatively short distance, something over 500 miles.

We must find a means of networking to bring television into the great national prominence which its merit deserves, and when we get that, are we going to be able to sell time on it to a commercial advertiser? Everything is predicated upon its ability to sell goods. The best illustration that I can give you is to visualize a commercial television broadcast in the future. We have tried out a number of possibilities in the laboratory to see how they will work. This might be a typical one, the maker of pancake flour. No one has to be told that pancakes and maple syrup are good, that would be a sheer waste of time, and it is rather of academic interest as to how fine the flour is ground, or from what part of the country it came, or how hard the wheat was. We may be interested, but it does not inspire us to eat pancakes, but let us see what television would do.

The scene might open up with a Negro mammy before the stove and a couple of youngsters standing alongside, and of course, very obvious, would be the box of the particular kind of pancake flour being advertised, and nothing would have to be said about it. She will mix the batter, flip the pancakes, with the little children standing beside her

(*Continued on page* 293)

Bernard F. Weadock Resigns to Resume Practice of Law

ANNOUNCEMENT of the resignation of Bernard F. Weadock, Vice-President and Managing Director of the Institute since its organization in 1933, was made and heard with sincere regret during the Convention. Mr. Weadock plans to resume the practice of law. For some time he has been anxious to return to his profession, and he felt that the decision of the Board of Trustees to have a full-time salaried president gave him the opportunity to withdraw from administrative duties and give all of his time to the practice of law.

MR. WEADOCK

Mr. Weadock has ably served the Institute since it was organized in 1933, when, as Counsel for the Public Utilities in the Federal Trade Investigation of the electrical industry, he was drafted into the position of Managing Director on an emergency basis to guide the Institute through its formative period.

Born in Saginaw, Michigan, Mr. Weadock studied at the University of Michigan in 1902-03, then transferring to the Detroit College of Law, from which he graduated in 1905 with the degree of LL.B. He was admitted to the Michigan Bar the same year, then beginning in the office of the Corporation Counsel of the City of Detroit, later becoming Assistant Corporation Counsel. From 1912 to 1920 he acted as General Attorney for the Detroit United Lines. From 1920 until 1924 he was engaged in the general practice of law in Detroit.

In 1924 he came to New York City, becoming a member of the firm of J. C. and B. F. Weadock, specializing in corporation law. In 1928 he was chosen as special counsel to represent the utility associations in the Federal Trade Commission investigation of the electrical industry. He continued to serve in that capacity concurrently with his work as Managing Director of the Institute until the conclusion of the Federal Trade Commission investigation.

At the closing session of the Convention the following resolution was adopted:

RESOLUTION

WHEREAS Bernard F. Weadock, who was appointed the first Managing Director of the Edison Electric Institute when it was organized in 1933 and has ably served in that capacity through its formative period, and who served the electric light and power industry as Counsel before the Federal Trade Commission for eight years, while that body was charged with the investigation of the industry, now desires to return to the practice of law, and has tendered his resignation to the Board of Trustees, Be It Therefore

RESOLVED, that this Convention record its sincere regret because of his leaving, its appreciation for the capable services he has rendered, and its best wishes for success in his chosen field of endeavor.

Progress in Rural Load Building

By H. E. Dexter

Vice-President, Central Hudson Gas and Electric Corporation, Poughkeepsie, N. Y.

An address before the Second General Session of the Seventh Annual Convention of the Edison Electric Institute, New York, N. Y., June 7th, 1939.

THE United States is a pretty big area to try and talk about. It has a wide diversity of soil and climate, and the living conditions of the people vary almost as widely. For the purpose of the use of electricity in rural areas the country can be divided into two main areas separated by the 100th meridian. West of this meridian the use of electricity in rural areas is influenced very largely by the need of water for irrigation, whereas east of this meridian irrigation is at present a negligible factor.

In addition to this, this western section is more a strictly farm market than the eastern. As we move east, the rural resident, who lives on income derived from a source other than the soil on which he dwells, becomes an increasing factor. This type of customer, in certain eastern areas, rises to as high as three or four rural dwellers to one farm customer, and has a decided influence upon the use of electricity in the rural area. Many of these rural dwellers are city reared, and electricity is the one thing that makes it possible for them to have city home conveniences in the country. These people all want complete electric service, because it means comfort and ease of living, and they are generally limited in the degree to which their homes are electrified, by their ability to pay for additional appliances.

As contrasted to this, the farm business is a manufacturing operation just like ours. For example, we take coal as a raw material, burn it under boilers, make steam, and finally turn out kilowatthours. The farmer takes grain and water, feeds it to his hens, and turns out eggs; or feeds hay, grain and water to his cows, and with proper management and care, produces milk. He faces depreciation in his plant (the houses, land and barns) and in his machinery (the chickens and cows) as we do, and, in general, faces the kind of manufacturing problems that we do, including regulation, even if it is limited at present.

MR. DEXTER

The principal difference between the farmer and other manufacturers is that, almost without exception, the farm is both his domicile and his place of business, whereas in the city the home and the place of business are usually widely separated.

How important is this farmer to us electrically?

In 1935—the last figures readily available—our 6,812,350 farms had 31,800,907 people living on them, or approximately 25 per cent of the population of the United States; 12,407,614 of these people were agricultural workers and represented 24.4 per cent of all workers in the country.

Now this looks like a whale of a market; on the other hand, there are certain very definite handicaps due to low farm income. If we omit the World War period, 1929 was the peak year for farm income in the United States. As contrasted to this, farm income dropped in 1932 below any year since 1909. In 1935, with slightly over 24 per cent of the population living on farms, agriculture accounted for less than 15 per cent of the national income.

While these figures do not present an alluring picture from a statistical sense, there is a real market for electricity on the farm if we understand and know how to sell it. Our farm manufacturing plant is copying our city manufacturing plant by increasing the use of mechanical power. Although this didn't start on the farm until 1900, it has grown rather rapidly. In 1936 there were approximately 100,000 rubber-tired tractors in use, and it has been estimated that by the end of 1940 there will be more than 250,000 in use. The big increase, of course, is in the automotive field. Here there are something over 8,000,000 units in use; or putting it another way, there is one automotive unit for every two horses and mules.

Applying mechanical electric power to agriculture isn't just a question of buying a tractor, an engine or a motor. It calls for a reorganization of the farm on a different scale, the acquisition of new equipment, and a higher degree of planning.

The greatest change was brought about by the introduction of the automobile. This transformed the farmer from a more or less isolated individual to a man with seven league boots. It permitted him to travel freely and has done much to broaden his experience and change his perspective, without consuming any additional time over what was previously used when the horse was the principal means of transportation. The use of tractors has resulted in larger farm units and a corresponding decrease in labor per farm. In 30 years the acres per farm unit have increased 20 per cent; the acres per worker 25 per cent. On the other hand, this has meant an increase in investment in equipment. The value of power units and accessory machinery per farm has increased 147 per cent, and the value of power units and accessories per worker 169 per cent.

Although electricity on the farm started by supplying light and power for pumping water, today equipment has

been developed so that it can be used for nearly every stationary light, heat and power operation both in the home and in the productive enterprise. For example, today we can pump the water, milk the cows, hatch and brood the chicks, cool the milk, ventilate the barn, heat the water for the calves and hens in the winter, light the laying houses, refrigerate the fruit crops, and many other important jobs.

The farmer's big problem today is to make more net profit, and there are three ways open for him to do this:

(a) Higher prices for his product.
(b) Greater volume.
(c) Lower cost of production.

I shall not discuss the first two ways, because electricity doesn't play such an important part in them. On the other hand, the question of lower cost of production depends entirely upon proper management and the use of modern tools, and there electricity has a real opportunity.

Electricity has brought to the farmer and rural dweller something they have never had before—a source of dependable power which makes it possible for him to make an automatic utilization of energy without human attention for extended periods of time. It is this automatic feature which is new to the farmer and which makes it possible for him to apply electricity, at a considerable saving in operating cost, to many operations hitherto carried out laboriously by hand. It is this automatic feature that has been largely responsible for increased demand for electric service in rural areas. Some idea of its importance may be gained from the following figures:

Our kwhr sales to the 1,410,000 electrical farms is 2,520,000,000, or approximately 2.7 per cent of all the energy sold to ultimate customers. Of these farms, 350,000 are in the irrigation area using 4356 kwhr per year @ 1.9c per kwhr, and 1,060,000 in the non-irrigation area using 1045 kwhr per year @ 4.5c per kwhr.

Electric service is now available to approximately one-fourth of our farms, according to census figures, and if the marginal farms and those that will eventually disappear as farms were eliminated, this percentage figure would be much higher.

Our real opportunity lies with these farmers and rural dwellers with electric service now available, and where our investment has already been made. In spite of the status of the farm income, this rural market has some excellent possibilities for us as utility people. It is a reasonably stable market and we have a source of energy which, if properly applied, will improve both the manufacturing and the living conditions.

In the farm production plant the tendency is for the farmer to do more processing at home before he sells his products, and I feel that this trend is going to increase. It is possible, in many cases, for the farmer, as he increases the amount of processing done at home, to increase his overall "take" from his manufacturing operation, and consequently his net profit. For example, in the fruit area, until a few years ago the fruit was almost all picked and stored in community cold storage plants, either operated as an independent business or on a cooperative basis. Today this operation is gradually being moved back to the individual farm, with the farm maintaining its own fruit storage plant. This offers several distinct advantages, the most important of which is that the farmer having his own plant can pick his fruit, put it into storage as picked, just as it comes from the field, and then sort and pack it after the picking operation is completed. This makes it possible for the individual farmer to materially reduce the labor peak, and by allowing him to sort the fruit after it has been picked and put in cold storage, to materially reduce the labor cost.

Electricity has many very unique advantages which make it applicable as a source of light, heat and power, where it is almost impossible to use other forms of energy. Our ability, however, to sell these to our customer is dependent almost entirely upon how well we know our customer's needs, and points to the absolute necessity of a thoroughly sound market survey upon which we can plan our development of this market. In making this survey we must not think in terms of appliances, apparatus or gadgets that may be on the market, but in the more fundamental services which electricity can render, such as light, heat and power.

When the customer's basic needs are known, the problem then becomes one of harnessing electricity to the job. In this operation we must have full cooperation of the equipment manufacturer in order that we may get the best overall results for our customer. It isn't always advisable to supply our customer's energy requirements 100 per cent with electricity. It may be in some operations, and in some localities it is more economical for a farmer to supply some of the high demand low usage requirements from a tractor and allow us to supply low demand operations, those with better load factor, and those where automatic operation is extremely important.

Due to the fact that the majority of this rural market is limited by its ability to pay for equipment, the most successful approach seems to depend upon our trying to supplant present sources of energy by electricity rather than to use the social aspect and attempt to sell a customer upon an entirely new standard of living. If we supplant present sources of power with electrical energy and do it for the same overall operating cost that the customer previously paid, we haven't taken anything away from him, and we haven't made him find any new source of money to pay for electricity. On the other hand, electricity, with the possibility of its automatic operation, generally will supplant enough labor on the part of the owner, his family, or his hired help, to make possible more time either for additional productive effort or for leisure, which eventually tend to better both his economic and his living conditions.

For example, every rural resident, whether he be a farmer or just a rural dweller, has some need for hot water, a little refrigeration, and some cooking. Why shouldn't it be done electrically? I do not mean by this that we need to sell the man an expensive range, a large storage water heater installed in his basement, or even the conventional refrigerator. There is a place for all three of these appliances, but not in every home. We all have many thousands of customers who cannot get the money to buy the present conventional equipment. Easy terms or rental plans may widen the market slightly for the present conventional equipment, but it is not the answer to the great mass of our low income customers.

Many thousands of these low income customers today are entirely content with a tea kettle of hot water three times a day. The way to do this job is to have some sort of an electrical device that will give them just that service. These customers do not have the money to buy the standard hot water storage system. When we find the answer to that problem—whether it be the electric tea kettle or the 1½ gallon non-pressure water heater, or some other device—we can sell electric hot water service to our cus-

tomers and the rate for electricity will not have to be eight mills.

The same thought can be applied to cooking, dairy barn water heating, electric refrigeration, and the many other rural uses for electricity.

As the home is common to both the farmer and the rural dweller, to both the irrigated and non-irrigated farm, let's look at how this idea might be applied to the kitchen of a very low income customer.

(Editor's Note: A demonstration kitchen exhibited on the stage was here introduced by Mr. Dexter.)

This kitchen you see here on the stage has a roaster-broiler-top burner combination—

Retail price.....	$36.50
Electric Tea Kettle..	6.95
Electric Refrigerator.	77.95
	$121.40

as a base price. Now, as the income level of the customer increases, other features can be added. For example, the next step in water heating is the 1½ gallon non-pressure water heater which costs $23.50, making the cost of the complete electric kitchen $144.90.

We have an electric pail that sells for five dollars, which might be sold at a dollar down, and it would be another step toward taking care of our rural water heating load. I realize to some of you this may look a little absurd, but the idea is we haven't taken advantage of our products in electricity.

Now for the low income market you shouldn't overlook the idea of meter selling using meters that take nickels.

If you will look in the *Saturday Evening Post* of May 13, 1939, page 12, you will see that the gambling business takes ten to fifteen billion nickels per year out of nickel machines. Nickels are small change—everyone is careless with them. Why not capitalize on this fact?

This complete kitchen equipment is being sold in my area at two nickels a day, and the customers like the idea.

As an indication of the possibility of meter selling, you might be interested to know that today, in our third year of meter selling, we are picking up from this device 250,000 nickels per month, or approximately 3,000,000 per year.

This equipment, although it looks small, will do all the cooking, furnish all the hot water, and refrigerate all the food used in a great majority of low income homes.

In the winter time, in the colder sections of the country, it may be good business to suggest to the customer that the electric tea kettle be kept full of water and allowed to set on the wood stove (there are a number of them in use), and only use the electric unit for the final boost in temperature when the water is needed. This helps to reduce the operating cost for your customer. It gives us some added kilowatthours at a profitable price, in this very low income market, and widens the field for heating water electrically.

This equipment is all plug-in equipment, wiring difficulties are reduced to a minimum, the problem of additional capacity is eliminated on the part of the utility, and you have equipment that can be sold en masse to our low income customers.

Now I can see a lot of skeptics in the audience. One says "it's just a lot of bunk—table cooking; in a week the roaster will be under the bed." Another says "it's too little—it will never cook for a family." Well, that isn't so, if the customer is properly instructed.

I have—	1	family	of 14	persons
	4	families	of 9	"
	35	"	of 8	"
	28	"	of 7	"
	72	"	of 6	"
	150	"	of 5	"
	290			

2300 families of from one to four persons doing all their cooking on this equipment for anywhere from six months to the full year—pretty good evidence that this equipment will do a good job.

Out of some 2500 of these roaster units sold, a field survey showed only 3 per cent that were not in use.

The question now is—just how effective this kind of equipment can be in building rural load for the utility, and just what can be done in spite of the fact that farm income is off if we follow the theory that we should attempt to replace other forms of power by electric power at the same overall cost as the customer has before he turns to electricity, and by a real efficient use of electricity by applying it as near to the point of use as possible.

Well, here are a few figures from my own company which are an indication of the possibilities in this field:

The increase in sales of kilowatthours to farms was 13 per cent in 1938 over 1937, and farm incomes were down—no fooling! The figure at the end of the year was 1769 kilowatthours per farm customer against the national average for non-irrigated farms of 1045. The average price per kilowatthour to the farmer was 3.71c against the national average of 4.5c per kilowatthour. But the "take" per farm for electricity was $65.72 against a national average of $47.03.

You don't need spectacular, expensive methods to sell this market. The maximum sales results seem to depend—

(a) upon the adaptability of the device to the customer's needs.
(b) upon the customer's acquaintance with it.

If we consider our entire rural market, which consists of 25,141 customers, 6000 of which are farms, the average annual usage was 1200 kilowatthours per customer and the average revenue $52.25. Last year, in one year alone, we sold approximately 10 per cent of these customers electric cooking, and 3 per cent of them electric water heating, all on our regular rates. These rates are not particularly high; they follow our costs. They are perhaps a little bit better form than some rates available, and perhaps follow our costs a little more closely. On the other hand, the principal reason for our high average rate is the fact that our sales have been taken on in the low income areas rather than in the high income areas where the follow-on blocks of the rate are lowest.

There are many things that recommend this method of developing our market:—

1st. It develops as near a depression-proof business as possible; each service sold to the customer is competitive in operating cost to his previous crude methods. He can't possibly save any money by throwing out electric water heating, for example, unless he discontinues all use of hot water.

2nd. Experience shows that increasing the use of electricity and its acceptance in this low income market is stimulating our higher income sales.

3rd. It is fast removing us from the position of where 50 to 60 per cent of our customers felt that they never could afford to heat water and cook electrically because the cost was too high.

4th. The development of this market can be done largely without any increase in our investment for lines and other facilities.

5th. It doesn't cost us any more to get this business than it does to get the business which is less profitable.

One of the recent issues of *Electrical World* showed that most of the companies throughout the country were spending from $1.05 to $1.10 per dollar of revenue added to its lines, and that the average rate per kilowatthour for this energy was 1.35c per kilowatthour, whereas our company spent $1.13 per dollar of revenue added, but added this revenue at 3.43c. The difference between these two

(*Continued on page* 336)

War Procurement and Electric Power

By General Charles Keller

Member, Board of Directors, Public Utility Engineering and Service Corporation, Chicago, Ill.

An address before the Second General Session of the Seventh Annual Convention of the Edison Electric Institute, New York, N. Y., June 7, 1939.

MOST of us remember the conditions produced by the last war and may recall that our entry into it found the government without any agency to scrutinize the demands of its war arms on industry and to distribute them so as best to promote their fulfillment at the least cost of time and money.

It was about a year after the declaration of war before such an agency was evolved. I refer, of course, to the War Industries Board, whose function, finally determined by the Act of Congress of May 30, 1918, was to control and regulate industrial production for the benefit of the war program mainly by decisions on priority of production and on the amount of raw, partly, or fully manufactured materials to be allotted and delivered to the various purchasing agencies of the government or to their contractors. The Board worked through committees, groups or sections, each generally charged with the supervision of a single critical item and the responsibility of dealing with it in its broad relation to other items and to production for the war program.

Considering the magnitude of its task and the many difficulties that had arisen before it was created, the Board had, by the time of the Armistice, become a remarkably efficient machine for the control of industry, finance, domestic and export trade, transportation by land and water, fuel, food and power, though, of course, it never achieved complete success in the co-ordination of its many difficulties. For reasons to be mentioned later, the intervention of the Board in our industry was only partly effective.

In order to be better prepared in future wars and to avoid the delays, troubles and greatly added cost experienced in 1917 and 1918, Congress in 1920 imposed on the Assistant Secretary of War a responsibility for organizing the war supply of the military forces closely similar to that which had finally been lodged in the War Industries

GENERAL KELLER

Board. By an amendment to Section 5a of the National Defense Act, Congress assigned to the Assistant Secretary of War "supervision of the procurement of all military supplies . . . and the assurance of adequate provision for mobilizing materials and industrial organization for war time needs." The War Department has very properly interpreted this mandate to include consideration and control of electric power as an essential element in the procurement of munitions.

Section 5a relates only to the land forces but it has been taken to imply that corresponding activities would be pursued by the Navy Department and that the efforts of the two departments would be so arranged and directed as to avoid interference and confusion. In consequence of this understanding of the will of Congress, there has been set up a joint agency of the government, the Army and Navy Munitions Board, which serves during peace time as a tie between those branches of the two departments that are connected with procurement of current requirements in the way of munitions and with the planning of the methods of supplying war needs and of the organization of industry to fill those needs. Under existing plans, this Board will on the declaration of war, become the nucleus of an agency to be called the "War Resources Administration" which will take over the functions of the Board, expand its personnel for the much larger war task and, thus started with a situation already under reasonable control, it will then closely parallel the work of the War Industries Board.

It will be helpful to examine the organization established by the Assistant Secretary for the discharge of his duty as head of the agency to supply our land forces with their peace needs and to promote the coordination and mobilization of our industries so that they may be relied on for the much greater needs of war.

As a preliminary, it may be useful to summarize the method of determining the kinds and quantities of the articles that are to be provided in time of war. Studies by the General Staff of the Army have determined the force to be raised by the United States in a war of self-defense, the only kind of war consistent with our national policy. Upon declaration of war by Congress, the War Department will take the first step in the program developed by the General Staff, namely, the mobilization of the "Initial Protective Force." This will involve the concentration at selected localities of a total of 400,000 men, consisting of the Regular Army and the National Guard, the units composing this force being expanded to war strength. These units must be armed, equipped, housed and fed at the places at which they are mobilized and eventually they must be transported to the theatre of war and there combined into field armies. As need arises, the program calls for successive additions, of predetermined size, to the force raised in this first mobilization.

To enable the various arms of the service to play their part in the first and in each succeeding step of mobilization,

the chief of each arm has been supplied with the complete program and has submitted to the General Staff, estimates or statements of the needs of his troops in and following each step of the schedule. If his arm is also a so-called "supply arm," the estimate includes quantities of all items that his bureau will be called upon to procure and to deliver to the troops from time to time.

The Secretary of War, through his Chief of Staff has, in turn, communicated these requirements to the Assistant Secretary and the latter has formulated a general scheme for satisfying them. This scheme provides for a high degree of decentralization under which the chief of each supply bureau is charged with the creation of an organization in his own bureau for the procurement of the items assigned to it by the plans of the General Staff, while the Assistant Secretary through an overhead group, exercises general supervision of the supply program, reconciles conflicts and coordinates activities so as to minimize misunderstandings and delays and to insure the best possible performance not only by the personnel of the War Department but also by the industries with which orders for war supplies have been placed.

During times of peace the Assistant Secretary and the supply bureaus maintain skeleton organizations to handle peace requirements.

Figure 1 shows in simplified form the peace organization of the War Department for procurement extending down through a single supply bureau, that of the Chief Engineers, which, in times of peace is charged, among other duties, with collecting certain information relating to power. There are seven other supply arms in the War Department. As they are organized for procurement similarly to the Corps of Engineers, I have not shown them on the diagram.

Decentralization is accomplished by committing to the regional Procurement Districts the duty of making certain peace time purchases, of becoming intimately acquainted with the industrial resources of their territory and of making preliminary arrangements, in accordance with a prescribed routine, for the production of articles for the war establishment by such of them as have, or are willing to install, the necessary facilities. The districts are also required to select and, by occasional exercises, to train some of the more important members of the large force that will be called into service for the effective war mobilization of industry.

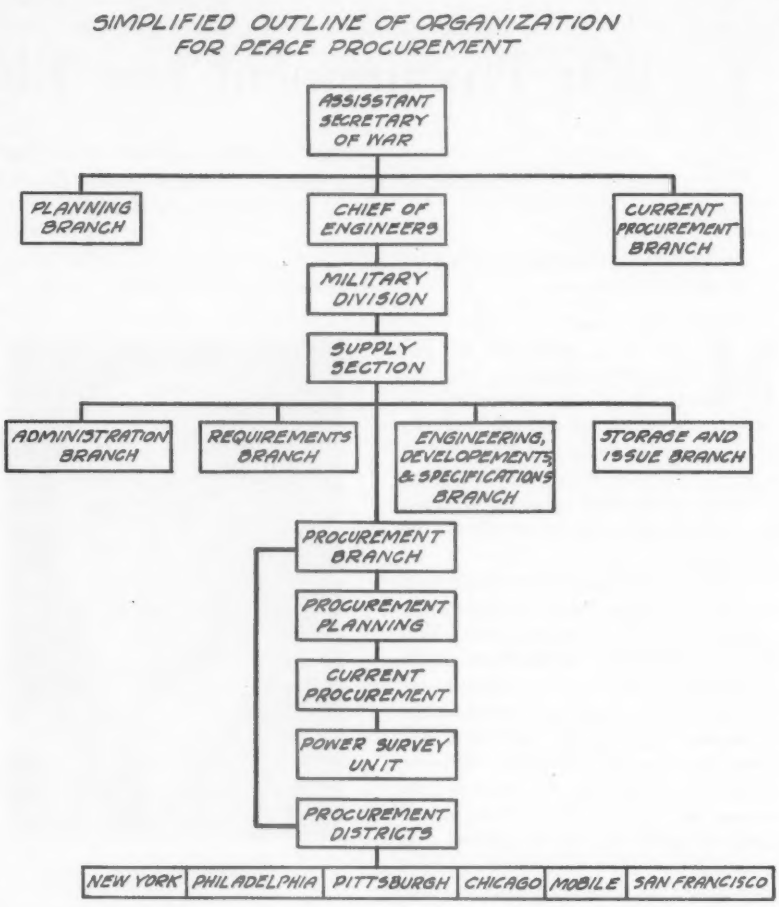


Figure 1

On the outbreak of war, the volume of business to be handled would increase with great rapidity and this will require the placing in effect of the *Industrial Mobilization Plan* which, under the law of 1920, it is the duty of the Assistant Secretary of War to formulate. While the law assigns this duty to him, because the Navy is, as already stated, also interested in this mobilization, by arrangement between the two departments the plan has been prepared by the Army and Navy Munitions Board of which the Assistant Secretaries of War and Navy are members. Quoting from an official statement "The Industrial Mobilization Plan prescribes the principles to be followed by the War and Navy Departments in their procurement planning, enumerates the control measures which must . . . be applied to the important elements of national economic life, describes the agencies to put these measures in effect and gives drafts of proposed requisite legislation. Although prepared by Army and Navy officers, this plan . . . visualizes civilian dominance in this field. . . ."

This "civilian dominance" is to be exercised by the already mentioned "War Resources Administration." A chart, Fig. 2, shows in outline the part of the proposed organization of this Administration that should interest you. Please observe that one of the units is a Power and Fuel Division. I shall return to these two diagrams later.

This rough description of the scheme adopted for peace procurement and war mobilization is a prelude to the explanation of my earlier remark that the intervention of the War Industries Board in our industry in 1918 was not entirely effective.

There was at first no single agency in control of procurement whether of materials or of power. Speaking of power alone, as far as I know, the first information that Washington had about trouble in our household was from complaints to the Secretary of War in the

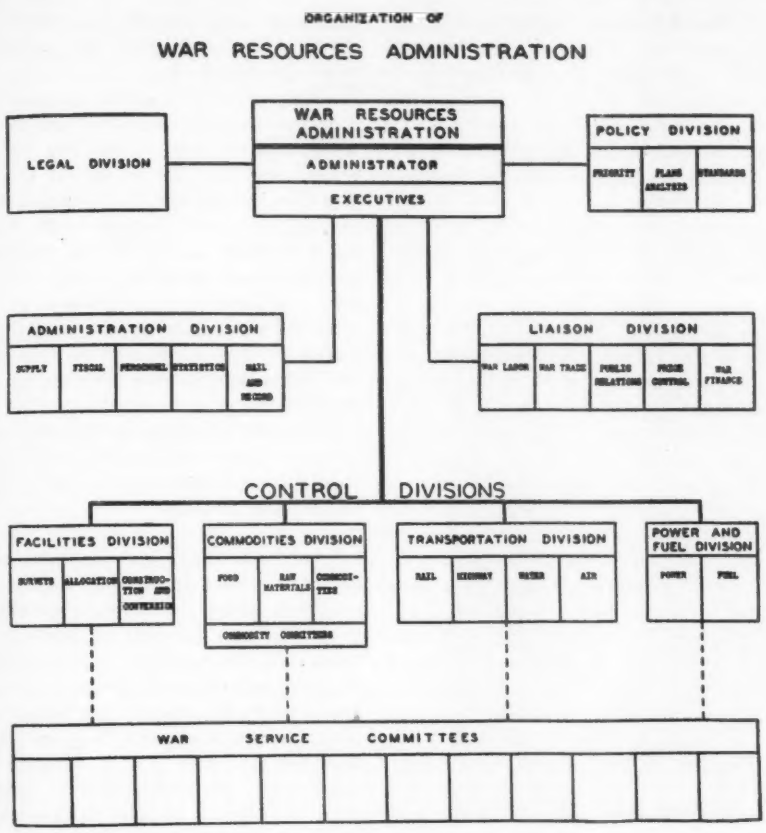


Figure 2

Fall of 1917 that the power plants in the Buffalo Niagara area were suffering from excessive demands on them aggravated by the failure to receive from Canada the quantity of energy called for by a long existing contract. Shortly afterwards, Pittsburgh reported trouble and, since there was then no agency on whom he could rely for advice as to what to do, the Secretary decided to assemble a group for that purpose. This group was, therefore, originally independent of any other war agencies of the government. It reported direct to the Secretary of War in regard to the various cases that he referred to it.

Lacking funds for construction of new facilities and hampered by the absence of a general policy for its guidance, the most it could do at first was, having ascertained where trouble actually existed, more or less arbitrarily to classify consumers as either essential or non-essential and to reduce or cut-off completely service to the second class. This operated to release some power for war uses. It was also possible to help some companies by exerting friendly pressure on interconnections, including that in Canada already mentioned. The group was able in some cases also to intervene with manufacturers of needed equipment and repair parts and it used probably non-existent authority to commandeer coal for certain distressed steam power plants. At the end of a short period of independent existence, it became clear that, to be really useful, it was necessary for the group to get the support of the War Industries Board and so the Board was asked and consented to incorporate the group, later known as the Power Section, into its organization. This affiliation gave the Section greater influence with other war agencies and with producers of equipment and enabled it eventually to participate with the committees of the Board in the creation of comprehensive priority lists, very helpful to the power companies, and in the solution of the broad problem of reconciling the power situation with a program for the orderly increase of production of war materials.

While the discussion of this broad problem was under way, during the summer of 1918 immediate relief became necessary in three localities, northeastern New Jersey, the Philadelphia region and the Pittsburgh area. With the effective help of the Chairman of the War Industries Board, an agreement was made between representatives of the Navy, the Shipping Board, the War Department and the Power Section under which financial help was to be given by these governmental agencies to power companies in these three localities in the installation of additional generating capacity. This program had actually been put into effect by the War Department with two companies near Pittsburgh and negotiations were under way in a third case in that locality when the Armistice was signed. In addition, the Section was largely instrumental in securing legislation needed to enable additional water power to be developed at Niagara Falls and work had been begun in 1918. For one reason or another, little was actually accomplished before the Armistice by either the Navy Department or the Shipping Board in the localities in which they had agreed to furnish financial assistance.

It would be an exaggeration to say that the Section accomplished a great deal in respect to power supplies. It did, however, help the industry to solve some annoying problems, it furnished a sympathetic and understanding tribunal to which the industry could and did appeal for relief and it was on the road to broader usefulness when the war ended.

As many of you already know and as has been shown in the two charts, the War Department now recognizes the vital importance of an adequate supply of power for every industry to which an order for war materials is to be allocated. You will recall that the peace organization of the Procurement Branch of the office of the Chief of Engineers has a Power Survey Unit. Its duty is to collect information concerning installed capacities, prospective increases therein and existing loads. This unit was established shortly after the war and it has, since then, from time to time asked for and received our help in formulating and revising its annual questionnaires, the latest revision having been made only a short time ago. These questionnaires are distributed by officers attached to certain of the river and harbor improvement offices maintained by the War Department. The resulting information is compiled and digested by the Power Survey Unit and thereby put into convenient form for any use which the Assistant Secretary of War may direct, including its consideration in the tentative allocation of manufacturing

facilities for procurement of war materials.

In the transformation of the peace supply organization to a war footing and its transfer to the proposed War Resources Administration, controls are provided for all industries directly involved in the war supply program and for many others whose connection with it are, at most, somewhat indirect. Naturally, therefore, the scheme for that Administration calls for a unit to deal with power, the Power and Fuel Division to which your attention has already been called. It is my understanding that this division will exercise control over power through special agencies organized in the first instance in the principal industrial centers by District Engineers of the War Department. The personnel of these agencies will consist of civilians selected for their expert knowledge, drawn most probably from our industry. Once organized, these agencies will be responsible to the Power and Fuel Division for the execution of its policies. To the extent that they require unusual authority for war purposes, this authority, as already stated, is to be temporary, merely for the duration of the war.

No official statement has been published concerning the manner in which control will be administered but its scope is quite clear. It will be local and Washington will enter to the least extent necessary to protect and supplement the supply of power. To this end, the district offices will undoubtedly be required to maintain and keep currently correct the information now collected in the power survey, thereby making known what has been called the power "capability" of each district, that is, its ability to supply further demands, the measures proposed by the industry for supplementing the existing supplies and the assistance, financial and otherwise, that will be required to relieve existing or threatened overloads and to execute the plans for expansion. Close cooperation between the procurement agencies and the local power control units will be established by the War Resources Administration so that war orders will be allocated with due regard to the availability of energy when production is to be begun and this cooperation will serve to reduce to a minimum the problems of the power control unit. Most important of all, constant friendly touch will be maintained with the managements of power companies and every effort made to help them in anticipating and solving their difficulties. For the rest, actual or impending shortages must be dealt with, as in 1917, by intelligent use of priorities, and by timely arrangements for installing additional capacity in the way of generating, transmission or distribution facilities as may be indicated by the power survey. I have already mentioned the difficulty experienced by the Power Section in securing government money for new construction so as to remedy actual stringency and to prevent threatened shortages. It is gratifying to know that it is proposed to provide the War Resources Administration with funds so that this phase of the problem of mobilizing power for war purposes will receive proper attention.

It is clear that we can now rely on orderly management of procurement for war purposes, including the procurement of power.

In the preceding, nothing has been said as to the amount of the power shortages experienced in 1917 and 1918 and of the light, if any, that they afford as to the probable increases in the demand for power in any future war.

As to the shortage of 1917 and 1918, as far as I know, there is no information available other than the somewhat fragmentary data contained in the published report of the Power Section entitled "The Power Situation During The War" and this is not stated uniformly for all the localities in which the Power Section had offices. Using those figures of the report that appear reasonably definite and positive, actual and impending shortages were estimated as follows:

Niagara Falls and Buffalo	112,000	Kilowatts
Pittsburgh territory	76,000	"
Northeastern New Jersey	35,000	"
Philadelphia and vicinity	60,000	"
Baltimore	42,000	"
Total	325,000	"

These figures are approximate, they relate mostly to expected increases in demand and they do not include any allowance for New England, for the South or for the Pacific Coast. They certainly warrant fixing the total shortage that would have been experienced in 1919, had the war continued into that year, at not over 500,000 kw. Obviously, this figure includes some considerable amount for normal growth of load for this was a period of rapid change to central station power by users of power from other sources.

Remembering that we were then manufacturing war materials for England, France and Russia, as well as for ourselves, and that we were fighting in Europe and expected to continue to do so, I doubt whether this estimated power shortage gives a great deal of evidence of what might be expected in a defensive war, especially in view of the timely control that would now be exercised over the placing of war orders. Yet the generous figure at which I have arrived as to the probable 1919 shortage is of some interest if it is anywhere near the figure for a future war. In the past, we have been accustomed to install twice as much capacity as this annually so that a shortage of that size would present but little difficulty to our industry.

The investigations of the National Defense Power Committee will soon furnish more definite figures upon which to base our thinking.

One final remark on war power supply and I close. It seems to me that it would be unwise to decide the localities in which war shortages of power will occur and their amount, and to install the indicated additional capacity at those places before we actually are engaged in war. Shortages are not likely to occur for some time after war is declared because early war orders will be placed with industries already in existence, amply supplied with power and able to use their facilities immediately without calling for additional power. When these plants have been loaded, then orders will be assigned to other manufacturers whose plants will require greater or less changes and who will not need additional power until these changes have been made. Finally, orders will go to those who will have to build completely new plants before they can start making war supplies and this will take still longer. Thus, on the outbreak of war, there will be enough power and, thereafter, ample time will be available to supply additional facilities where they will actually be needed.

In my opinion, it will be sufficient in the way of preparedness for war to complete, in time of peace, detailed designs for generating units of agreed size, together with accurate bills of material and schedules of delivery for the various items of machinery, equipment and materials in accordance with the details of an efficient construction schedule showing time intervals in days from the beginning of construction for the completion of the various stages of the agreed plan. As soon as the need of more capacity develops, steps can at once be taken to put this proposal in effect at

(*Continued on page* 320)

The Case for Central Station Power

By H. M. Sawyer

Vice-President, American Gas and Electric Company, New York, N. Y.

An address before the Third General Session of the Seventh Annual Convention of the Edison Electric Institute, New York, N. Y., June 8th, 1939.

THE history of the growth of the electric utility industry in the United States is recorded by statistical milestones which approach astronomical proportions. If we compare the total sales of electric energy to all consumers, which in 1912 totaled 11,770,000,000 kwhr and a gross revenue of $313,000,000, to the 93,894,274,000 kwhr and gross revenue figure of $2,168,495,200 for the year 1938, we begin to appreciate that this phenomenal growth has occurred on a scale of magnificent proportions. It has been my happy privilege to personally experience and live with the industry through all of this period and from this vantage point of perspective I prefer to view present trends and policies as a detail of the complete picture rather than as individual and isolated problems in themselves.

You will agree, I think, that there is a tendency on the part of the industry as a whole to view with some alarm and apprehension the effect of present-day isolated plant competition. My own personal reaction has been that the basic facts do not justify a pessimistic outlook, and the imaginative evils which some view as a future possibility need not and probably will not obtain. On the contrary, I feel that an impersonal analysis of the competitive situation today and a review of the facts surrounding the growth of the industry should strengthen our confidence and reinspire us with the rugged determination we have heretofore displayed in making the history of our growth.

The expansion of Central Station Service is so definitely landmarked with isolated plant competition that it may be truthfully said it has thrived on, and because of, such competition. In the early days of the industry, particularly in the field of power, the more commonly accepted medium was steam and the expansion of electric power was vigorously contested every inch of the way by constantly improving steam prime movers. The original slide-valve engine soon gave way to the comparatively remarkable results of the Corliss Valve which in turn was improved upon by the increased efficiencies of the uniflow engine. The modern development of the turbine is familiar to all of us and the present-day trend to superimposed or topping units should make us mindful of the fact that steam efficiencies are still being improved and will, no doubt, continue to improve. Engineering progress in improved efficiencies was not confined to prime movers alone since boiler efficiencies were likewise keeping step and steam as a competitor was certainly a worthy opponent, particularly since it also enjoyed the intangible but nevertheless definite advantage of being well known and familiar, as compared with purchased electric energy. We can better appreciate this constant improvement in steam efficiencies if we note that a fair average duty figure for the early slide-valve engine was 135 pounds of steam per kwhr, while the modern high-pressure, high-temperature turbine of competitive size, approximates 15 pounds of steam per kwhr and very large units can show an operation approaching 8 pounds of steam per kwhr.

MR. SAWYER

The internal combustion engine fueled by gas or gasoline likewise contributed a keen competitive element to the growth of the electric utility industry. The need for improved transportation facilities and the immediate public acceptance of the automobile made it more profitable from an economic standpoint for the concentration of mechanical research in the medium of transportation rather than in the field of the stationary internal combustion engine. It naturally followed, however, that such improvement in design of the automobile engine was eventually reflected in the stationary engine. The first automobile is still within the realm of memory, and yet in that comparatively short period, efficiencies have increased until today's aircraft engine has a weight of about one pound per horsepower output.

In the United States, the Diesel engine began to appear during the period of the World War and has, of course, contributed largely to the competition from internal combustion engines. I desire to discuss Diesel competition later and will, therefore, leave it for the moment with the definite assurance, however, that the competition from this medium was always keen and could not in any sense be minimized.

We are prone to look upon lighting today as a non-competitive item but the difficulties encountered in the replacement of gas and kerosene lamps are still vividly recalled by many of us. Electricity was new, poorly understood, and to a large extent untried and unproved in the public's mind which, together with service facilities that had not yet reached present-day standards, naturally resulted in a strong sales resistance and, therefore, intensified the competitive angle.

The very life blood of Central Station Service was this ever-present isolated plant competition and, the industry's struggle for expansion, growth, and very existence was a healthy condition, supplying the basic motive for constant improvement and advancement. The electric utility industry's answer to this com-

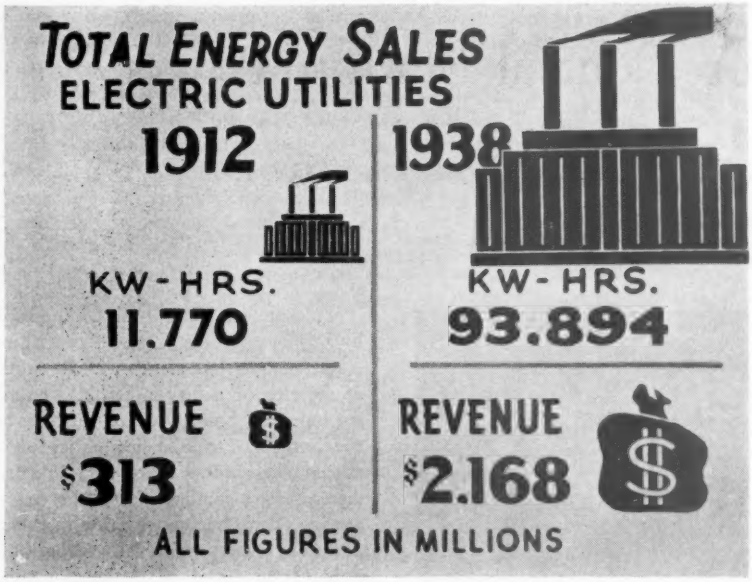


Chart 1

petition was and, I am convinced, always will be, constantly improved service, lower costs, new developments in appliances contributing to the health, happiness, welfare and profit of the customer, improved efficiencies and an aggressive and tireless process of not only selling but actually educating the public to the advantages of its service and product.

The growth of the industry in the face of this competition is certainly indicative of the value and soundness of the basic principles of Central Station Service. We offend all tenets of logic if we suppose that such growth and such expansion come about other than as the natural result of basic and inherent advantages peculiar to Central Station Service, and it is permissible to further contend that those same advantages exist and are a definite part of our structure today.

Let us analyze certain fundamentals and problems confronting any industry. Prior to the availability of cheap and dependable Central Station Service, the location of an industrial plant was influenced to a great extent by a consideration of the following factors:

1. Proximity to the finished product market.
2. Proximity to cheap and acceptable raw materials.
3. Ready availability of good labor.
4. Availability and low cost of the necessary fuels, water, and other materials necessary for the production of power.

Coincident with the availability of cheap and dependable electric energy from Central Stations, the necessity of considering the fourth factor above was eliminated and the determination of an industry's geographical location was reduced, therefore, to the consideration of only those factors which logically and directly contributed to the manufacture and sale of the finished product. It likewise follows that the elimination of one factor is at the same time the elimination of one variable contributing to the possible profit or loss of that industry. While electric energy was being made more readily available and its costs constantly lowered, the tax levy against industry was and, of course, still is, rapidly rising and assuming a major significance. The economic availability of Central Station Service permitted an industry to select a location which offered a minimum in taxes. The necessity for cheap power producing fuels would, of course, have practically eliminated this option on the part of industry and the present-day industrial movements would have been made difficult, if not impossible. If these tenets are true we can assume with justification that today's isolated plant is affected by those same factors and, therefore, whether Diesel or any other type plant, it must enter the competition with Central Station Service with certain automatic and primary disadvantages.

The time, study and consideration given by the electric utility industry to the analysis of Diesel competition is to be commended, and yet a broad picture of the situation in its entirety does not by any means supply the relative justification for such intensity of effort. To avoid possible misinterpretation, I desire definitely to state that I heartily agree with and commend such an aggressive preparation for the meeting of any competitive situation, but I also feel that our mental reactions give an importance to the possibilities of Diesel competition that are inconsistent with the actual data and figures, as well as the basic fundamentals involved. It might be well to review the entire competitive situation

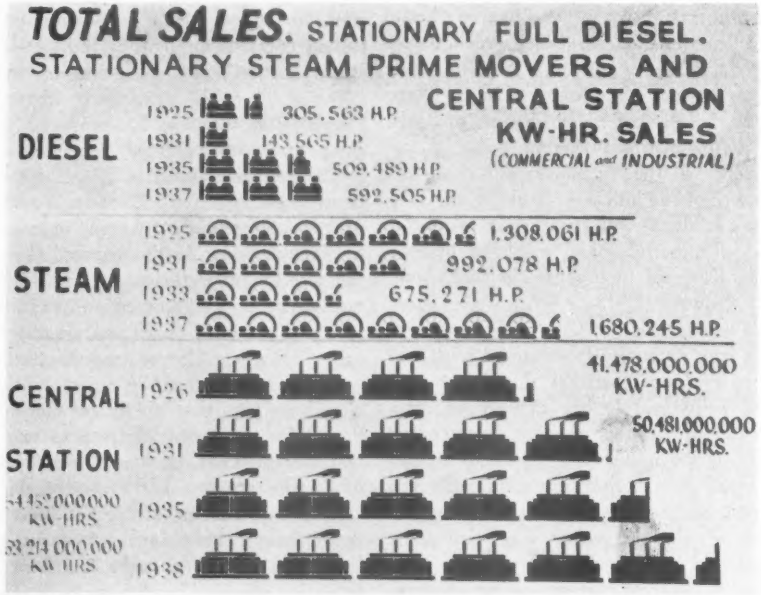


Chart 2

over the past two decades, limiting it to this period in order that the Diesel figures might be made available.

As an index of the growth of Diesel power, we find the following record of total sales as reported for all stationary installations. It is unfortunately impossible to eliminate from these figures the horsepower of those installations which replaced existing Diesel installations. Due to the recognized short economic life of this prime mover, it is my opinion, however, that these replacement installations form an appreciable percentage of the total listed below:

Total reported Diesel sales (stationary installations).

1925—305,563 h.p.	1933— 66,505 h.p.
1927—252,228 h.p.	1935—509,489 h.p.
1929—292,148 h.p.	1937—592,505 h.p.
1931—143,565 h.p.	

In considering steam prime movers over the same period, we are forced to include in our figures the installations in Central Stations which, of course, will again, in this instance, constitute an appreciable percentage of the values given below:

Total reported stationary steam prime mover sales (reciprocating, turbine and turbo-generator).

1925—1,308,061 h.p.	1933— 675,271 h.p.
1931— 992,078 h.p.	1937—1,680,245 h.p.

During a like period, the sale of electric energy by the electric utility industry to those customers classified as commercial, small power and industrial power customers, was as follows:

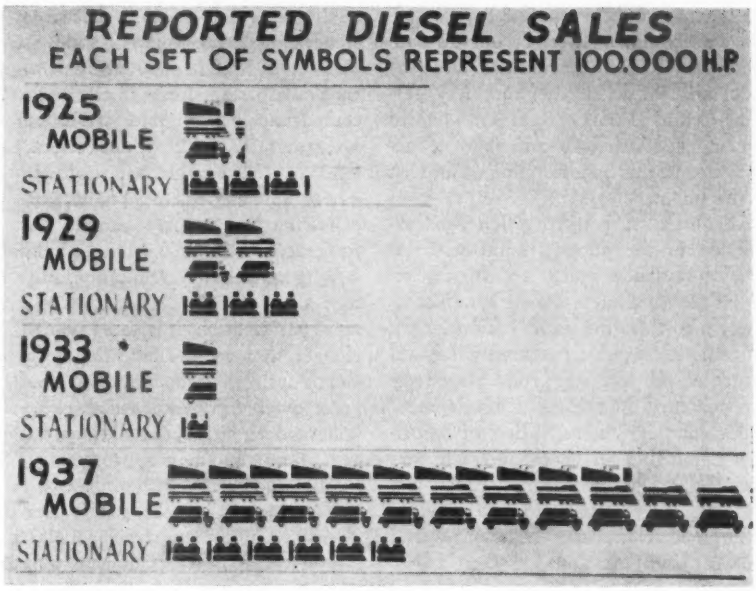


Chart 4

1926—41,478,000,000 kw. hrs.	
1928—49,407,000,000 kw. hrs.	
1930—54,092,000,000 kw. hrs.	
1932—43,070,000,000 kw. hrs.	
1934—49,212,000,000 kw. hrs.	
1936—64,267,000,000 kw. hrs.	
1938—63,214,000,000 kw. hrs.	

These data permit many interesting studies, but the significant trend is reflected by the fact that stationary Diesel sales increased in 1937 by 286,942 hp. over the sales for 1925. Steam sales for stationary applications in 1937, was an increase of 372,184 hp. over the sales for 1925, while Central Station Service sales to commercial, small power and industrial customers increased 21,736,000,000 kwhr in 1938, over the sales for the year 1926.

An unbiased examination of these figures certainly does not justify the importance that we, as well as the general public, are prone to attribute to the Diesel engine and its potential effect as a competitor. To the contrary it would seem that our chief competitor is still steam and that Central Station expansion has occurred along lines that are not approached by either of the two competitors.

In my own company, our statistical records tend to corroborate the general trend of these figures. In 1938, the total affiliated companies lost 663 kw in load to Diesel and 3,050 kw in load to steam competition. In the same interval (1938), the same companies replaced 182 kw of Diesel load and 3,525 kw of steam load. These figures represent only replacements and do not reflect the new business secured during this period against keen competition. The Diesel engine contributed to a major extent to this competition and yet the above totals become relatively insignficant if we appreciate that during the year 1938, our companies secured 43,496 kw in new and increased load.

Were we to stop at this point, we would certainly be justified in seriously questioning the potential importance of Diesel competition and yet to what then

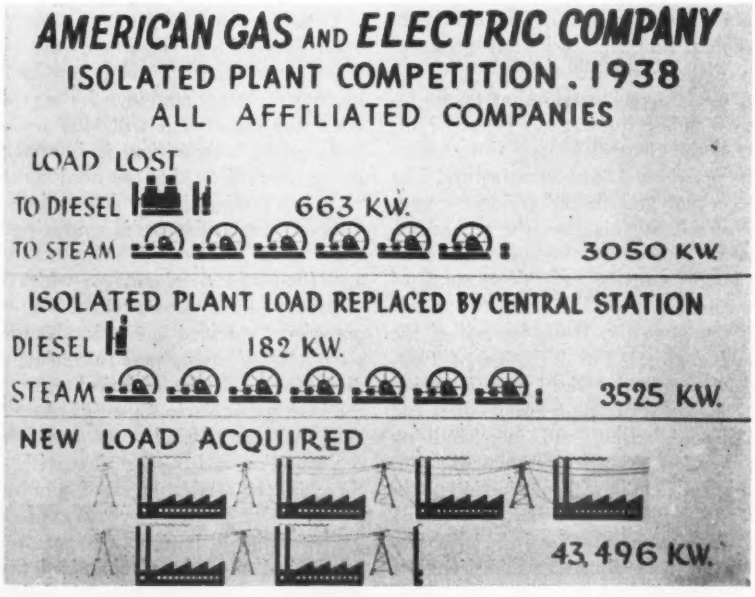


Chart 3

can we attribute the interest by the general public, and likewise by our own industry, in Diesel possibilities and the importance attached thereto. My personal feeling is that certain well-defined psychological reactions contribute a major factor to this manifestation of interest by the public.

All forms of transportation are surrounded in the public's mind with an aura of romance which is naturally reflected in the interest shown by all of us in any factor dealing with transportation. To some extent this has been a natural result of the primary role played by transportation in the rapid development of our country, but regardless of its origin, it remains an accepted truth that from the day of the covered wagon and clipper sailing vessels to the modern streamlined train and transcontinental aircraft, transportation has been front-page news and public interest has always been assured. The part that the Diesel engine has played in modern railroading is familiar to all of us and it has been a prime factor in creating interest in all forms of Diesel engines. We might justifiably go a step further and note that so firmly is the Diesel engine associated in the public's mind with modern streamline transportation that many achievements of competitive prime movers in these modern transportation vehicles are erroneously credited to the Diesel engine.

The modern steam turbine-driven locomotive, produced for the Union Pacific, illustrates further that steam cannot as yet be eliminated from consideration as a future efficient prime mover for fast, lightweight railroad usage. In order to win its place as a prime mover in modern high-speed transportation, the Diesel was forced to undergo vital basic improvements. Since heat and high pressures are inherent characteristics of the Diesel cycle as compared to the Otto and Carnot cycles, weight was an essential part of the design. In transportation, however, the ratio of dead load to pay load must be reduced to a minimum, thus contributing a constant incentive toward the reduction in dead load. To accomplish this, the metallurgical sciences contributed the modern lightweight, high-strength alloys which provided an essential tool for the Diesel engineer. The weight of the early stationary Diesel engines approached 400 lb. per horsepower, while the small high-speed stationary Diesel engine of today weighs about 12 lb. per horsepower. Aircraft Diesels, while still in the experimental stage, show a weight of 1½ lb. per horsepower. It is important to note that from the standpoint of the isolated plant, this reduction in weight was of little significance since the increase in efficiencies was comparatively negligible. Bulk and size are, generally speaking, not serious problems in the consideration of a prime mover for an isolated plant, since the prime mover is not a mobile piece of equipment. However, this reduction in weight immediately reduced another factor; namely, the cost, and cost is a definite consideration in isolated plants. The pioneer slow-speed Diesel could cost almost anything, although about $120 per horsepower was perhaps a median value. The modern high-speed stationary Diesel can be purchased at approximately $35 per horsepower.

The interest of the public has been intensified by the numerous articles written on transportation subjects, in which the writers have been influenced to a greater extent by their enthusiasm and desire to construct an interesting and appealing story than by the cold facts and physical theorems involved. This has been particularly marked in those articles which attempt a translation of the results obtained in the field of transportation to the field of the isolated plant. Manufacturers, likewise, through the media of the various trade journals and other periodicals, have made claims relative to imaginary savings as compared with Central Station Service which will not stand up in the cold daylight of actual figures. It would be an obvious injustice to infer that this action is shared by the entire Diesel industry, since many of the manufacturers rigidly adhere to an honest and eminently fair presentation of their product.

A final factor contributing to the increased public interest has been the advent of the General Motors Corporation into the field of Diesel manufacture. The phenomenal growth and eminent soundness of this organization, the general acceptance of their automotive products by the public, and the general character of the company have, of course, greatly contributed to the public interest of the Diesel engine. The inclusion of General Motors in the Diesel manufacturing field at once contributes an excellent and experienced selling and merchandising organization, an organization with valuable knowledge in mass production methods and engineering ability, and finally an organization with the financial ability to enable them to market Diesel engines under liberal financing plans. It seems only natural that general public interest would be intensified by the participation of this firm.

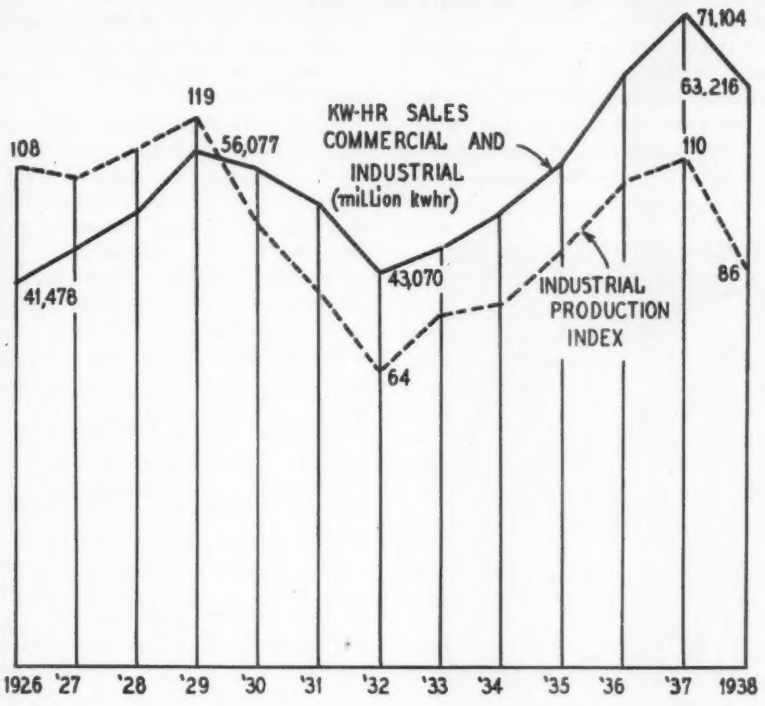
My personal feeling in this matter is perhaps better expressed by the words of Mr. R. K. Evans, Vice-President, General Motors Corporation in his speech before the Institute Sales Section, March 31, 1938. You are all familiar with this speech and yet it expresses the logic of the situation so clearly as to permit the repetition of some excerpts. Mr. Evans said:—

"Briefly, our opinion is that generally where electrical power from central stations is available, at a reasonable rate, there will be little market for Diesel Packaged Power in stationary installations.

"General Motors produces a wide variety of products and has many customers in every community. We believe that we enjoy the confidence of the public to a considerable degree. It would not be to our interest to abuse that confidence in any way and we cannot afford to have dissatisfied customers. We intend to aggressively merchandise our Diesel products wherever they may be used to the advantage of the prospective customer. But we will not mislead such prospective customers nor will we allow our dealers to do so." This general outline of policy is firmly corroborated by a letter dated April 28, 1939, from the General Motors Sales Corporation, W. J. Davidson, General Sales Manager, to all Diesel Engine Division Distributors. The utility industry cannot hope for and certainly does not want competition along lines other than these.

It has been my purpose to recount the main essentials of the competitive situation confronting us today and in this manner substantiate my feeling that while the Diesel unit will offer us keen and worthy competition, it is certainly not a competition that we need contemplate with misgivings. An analysis of Central Station Service is reassuring because of the existence of many economic and fundamental advantages which are of prime value to the customer. You will note that I specified economic advantages since it is not my purpose to confuse this discussion with the technical aspect of the case, particularly since this phase has been so often and ably presented. It is my intention rather to review with you those inherent advantages of purchased power which, for the very reason of their well-established nature, are apt to be overlooked or at least minimized to an extent not commensurate with their actual importance.

Comparison of Industrial Production Index with Central Station Kwhr Sales to Commercial and Industrial Consumers.



It is a well-established fact that the chief reason for business failure is the tying up of too much capital in fixed assets, thus freezing those same assets and as a result leaving far too little available for working capital. Regardless of the size, every business is forced to meet and compete with constantly changing conditions, and money invested in an isolated plant can well prove to be the deciding factor between solvency and receivership. An examination of the many isolated power plants idle today which can be purchased for a very small fraction of their original cost will bear out this statement.

When considering investment in a power plant, the customer should carefully consider the possible return a like investment in his manufacturing equipment or methods could reasonably be expected to produce. Certainly with today's market conditions prevailing, the value of a quick turnover is apparent. The industrial or commercial owner must realize that the production of power does not directly produce his finished article. It is not even the machine which makes his product and in investing in an isolated plant, he immediately becomes vulnerable to the many variables and contingencies which make up the cost of a power plant's operation. To be specific, the owner of a Diesel plant immediately falls heir to the vagaries of oil prices and of probable future taxes on oil which will radically affect its cost to him. He immediately becomes an affected party in labor uncertainties and is a lone figure in a troublesome sea of factors that he cannot control. He should be mindful of the fact that an isolated plant is not a necessary evil, since it can be eliminated by purchasing his requirements from the Central Station, thus fixing upon them the responsibility of meeting those very same factors which he is so poorly qualified to compete with or control. This same Diesel purchaser should further appreciate that by investing in a power plant he is actually "pegging" his investment at a point and under conditions which will not logically or reasonably obtain again. In the language of the financial world he is investing in a declining market. We have already considered the possibilities of a fluctuation in oil prices and while it is admitted that our large industrial tariffs are to some extent affected by wide fluctuations in coal costs by the inclusion of coal clauses, the effect of these clauses represents but a small increment of the total Central Station charge and hence affect the customer only in proportion. The Diesel owner must accept the fact that engine efficiencies and performance are peak at the time of installation and must reflect a more or less gradual decline over each succeeding year of operation. The advancement in design and performance of future engines, which will certainly come about, must be forgotten by the owner since his engine is an actual installation and must so remain for the period he has chosen as its normal useful life. Increased production may well result in lower Diesel capital costs in the future which, however, can only contribute a loss to the Diesel owner of today since the future marketing of a more efficient, lower cost engine reduces the value of his engine correspondingly, while actually the money he invested in his engine must unhappily remain fixed.

Regardless of his sincerity in his selection of a write-off period for the engine cost, the fact remains that the actual economic life of an isolated plant is almost always less than its useful physical life. This is not a contradictory statement nor one that is difficult to analyze. The constantly changing economic conditions are not predictable and we do not have to look back very far to recall the movement of the steel industry westward, the exodus of textiles to the South and the decentralizing movement of the automotive industry from Detroit and of rubber from Akron. An isolated plant is a fixed asset both financially and geographically and it cannot be moved without an exorbitant cost and lowering of value. The larger industrials appreciate the value of these factors and reflect this knowledge in a common policy of writing off their invested capital in private plant within a short period of two or three years. The Diesel owner must, on the other hand, appreciate that he is competing against Central Station Service charges that are anything but "pegged." The record of constantly lowering costs of Central Station energy over the past twenty years is a record of achievement to which the utility may point with pride. The Diesel owner's appreciation of the item commonly referred to as obsolescence is vital.

I have tried in this talk to describe without prejudice or exaggeration, the advantages of Central Station Service which I feel are ofttimes neglected by the industry in our contacts with the customer, simply because we are prone to discuss the technical and engineering phases of the situation in spite of the fact that the customer is rarely an engineer. Admittedly, up to this point I

have said little that might not be characterized as a general analysis of the situation. To justify your patience and this paper's very right to exist, it should certainly offer some constructive ideas along the lines of possible means of meeting this competition. I do have some definite convictions in this respect although you have no doubt heard them many times before, since I cannot claim authorship.

With the firm conviction that competition has been a vital factor in the growth of the electric utility industry, it would seem to me that the Diesel situation offers to us the opportunity to contact our customers on a scale heretofore not attempted. By contacting the customer, I mean to know, understand and appreciate his problems, to be able to talk his language and in this manner render ourselves capable of extending the maximum in service to him. Many times a better understanding of his problems will increase our usefulness to him and tend to eliminate those factors of doubt which are certainly not conducive to a mutual understanding. He has many problems, the correct solution of which are necessary for his very existence, and I am convinced that we may well be able to assist in the happy solution of some of them. To know the customer better means likewise that the customer will know and better understand the electric utility industry. A better realization of our problems, policies and limitations will tend to remove the cause of many subsequent misunderstandings. More frequent contacts will further serve to give you knowledge of contemplated installations at an early stage, and we can all recount cases where we could have shown the customer, before it was too late, the results which were bound to follow his decision, had we known of the situation in time.

The experience of my company indicates the use of a competitive power album to be quite effective in meeting the Diesel situation as well as for the entire field of competitive power. This booklet consists of actual photographs showing customer installations before and after the introduction of Central Station Service. The photographs carry a brief caption describing without prejudice the original prime mover, its reason for replacement and a brief description of the electric replacement unit. Billing items and other similar data are deleted and in the main the pictures are permitted to tell their own story. We find in general that these booklets are quite effective and well worth the effort to compile.

In an earlier portion of this paper I had occasion to refer to those articles which appear frequently in trade journals and in other periodicals with a national circulation. My criticism is directed only against those articles reflecting an utter disregard for factual data and the formulation of opinions either directly or by inference which do not stand up under an analysis by competent authorities. The effect of such articles is apt to be misleading with harmful and disappointing results, in that the general public cannot be expected to appreciate the fallacies of the claims and statements. I have noted with considerable satisfaction several instances in which utility executives immediately communicated with the author and the publication acquainting them with the misleading or erroneous nature of the statements contained in the article. One particular rebuttal, which I have in mind, was written in a diplomatic, impersonal vein, but the clarity and logic of the contentions effected a prompt acknowledgment and retraction by the author, and the publication. As individual members of the utility industry, we should consider it a duty to our company and an obligation to the public welfare to see that articles and statements of a nature tending to erroneously state conclusions or reflecting comparative factual data which is untrue and therefore against the best interests of the utility, are effectively refuted. The activity of the Edison Electric Institute in this line of endeavor has been effective and commendable.

In our own organization we are firmly convinced of the necessity and justification for adequate breakdown or standby provisions in our commercial and industrial tariffs. This stipulation of conditions affecting service is designed to clearly describe and define the conditions under which the utility will render standby or emergency service to those customers who generate their energy requirements, in whole or in part. It would seem desirable that such a clause be designed to insure the utility of adequate compensation for the fixed charges resulting from the service facilities required by the customer, for the reason that such adequate compensation in most cases exceeds the minimum charge in the usual tariff applicable to a customer purchasing his total energy requirement. We further believe that such a clause should cover all of the customer's energy applications, whether electrical or direct connected mechanical prime movers, provided, of course, that the utility is required to furnish standby service for that particular application. Such compensation is not only a just charge but further tends to place the economics of the competitive situation on a fair and equitable basis.

In all fairness, it would seem to me that the Diesel may quite possibly have a definite place in our national picture. The cost of the facilities required to render service to isolated consumers often makes the cost of purchased energy prohibitive and the utility in other instances cannot serve the customer under the then existing conditions. In still other cases, it may develop that due to the extremely hazardous or uncertain conditions under which the industry is operating, the utility could not take the risk of serving this customer without adequate guarantees which might not be economically possible for the customer to meet. And finally, due to unusual operating conditions in certain locations, it may develop that the utility's rate structure will not effectively meet Diesel competition. In these and similar instances, the Diesel engine may justify its selection and we should recall that the prime movers of the past developed and pioneered many of our present markets up to the time when the electric utility could and did replace these prime movers under competitive conditions. In the field of transportation the future of the Diesel seems assured and we may expect that scientific development and research in the mobile types of engines will be reflected eventually in stationary Diesels and offer us continued competition.

If I were privileged to leave one thought with you, it would be this:—

We should be constantly mindful of the fact that we sell a service and, if the value of that service is not commensurate with the value that the customer receives as a direct result of it or, if our charge for such a service is greater than the cost of duplication from another source, we cannot hope to retain such business, and I am sure we don't desire such business. Happily, however, we have been endowed with advantages which in general do not support such a condition; and, with the secure thought that the electric utility industry has survived and expanded under keenly competitive conditions in the past, the contemplation of what the future may hold for us in this respect is reassuring in that the necessity for those same principles conducive to improvement and advancement is assured.

Balanced Load Building

By George E. Whitwell

Vice-President in Charge of Sales, Philadelphia Electric Co., Philadelphia, Pa.

An address before the Second General Session of the Seventh Annual Convention of the Edison Electric Institute, New York, N. Y., June 7th, 1939.

THE subject of Balanced Load Building is so broad that no attempt can be made to do other than define it, comment upon certain phases of it, and point out that which appears to be its unusual significance to electric utilities, particularly at this time. No attempt will be made to explore its technical aspects on which many papers have been written and some of them published in the recent past. There can be presented, however, some highlights in defining and discussing the subjects.

Conditions vary so widely, in various utilities, with respect to the relationships existing between different classes of loads and within each load classification, that it is not feasible, in order to reach the desired objective, to set up any single rule or formula which can be properly applied to all electric utility situations. It is possible, however, to illustrate that which is meant in the discussion of particular phases of Balanced Load Building by using, as illustrations, studies of a particular company. It is hoped that the discussion which follows, although not new to many members of this audience, may be of some value in directing attention to the problems involved so that study of them will be continued, and perhaps expanded, in the light of the circumstances which appear definitely to exist.

For any utility system, at any stage of its development, there is a point of maximum service economy which can be attained only with a definite relationship between the loads of the several business classifications, i.e., residential, commercial and industrial, and between the major types of load within classification. A load building program which produces this theoretical maximum service economy can be said to be perfectly balanced. It represents a theoretical ideal and, as such, is the same for all utility companies. Dealing, as it does, only with utility costs, both fixed and operating, it is unaffected by any considerations of rates, business conditions or competition. Consequently, except as a statement of a theoretical goal, it will not be discussed further in this paper.

MR. WHITWELL

More practically, for any system, a load-building program is adequately balanced if it recognizes the many factors involved in approaching conditions of maximum service economy and of adequate net income and is directed to attain the closest possible approximation of both. Even this practical definition of Balanced Load Building must clearly recognize that the problems to be solved in reaching the objective are not susceptible to exact mathematical solution. These problems involve not only utility costs and maximum economy in connection therewith but also such important items as the relationship of rates to costs; the effects of business depressions; the nature and amount of industrial development; the present and future load charteristics of different classes of service and of major loads within classes; the amount and kind of outside pressure for rate reductions; the character of competing fuels; the degree of load saturations; and many other factors.

At best, present and future points of maximum balance in load building can only be roughly established. Nevertheless, it is possible, and highly desirable, to approximate them.

A practical analysis of the major features which determine the best balance in load building must, therefore, recognize certain characteristics, which are significant and, at times controlling, in their effects upon an adequate solution of the problem for any individual case. Fortunately, however, in studying a specific case, the situation can be materially simplified by making certain assumptions.

Consequently, in trying to make my subject clearer by using, as an illustration, the specific case of a large eastern metropolitan utility, a practical study of Balanced Load Building can begin by making the following assumptions:

1. The discussion applies only to the loads of industrial, commercial and domestic classes of service.
2. Rate structures of different classes of service are assumed to follow closely the cost relations applicable thereto.
3. Unless otherwise specified, the shapes of each class of service load curves during the critical period of the system load are assumed to remain unchanged for all volumes of added load of each class; and correspondingly, the annual load factors of each class are assumed to remain constant.
4. The relative volumes of load of the domestic and commercial classes of customers are assumed to change in the amounts of use of individual customers without a change in the total number of customers comprising the class. The volume of load of the industrial classes of customers is assumed to change either through a change in the amount of use of existing customers, or through the acquisition of additional customers of a size approximating the size of the average customer of the class.
5. The price structure of electric utility service is assumed to be competitive with prices of other equivalent forms of power and fuel, and the market is assumed to be not saturated.
6. Present methods of power production are assumed to continue.
7. The analysis applies to normal business conditions.

The foregoing assumptions deserve real consideration and, consequently, should not be passed over too hastily because they presuppose, in any utility making a study of balanced load building, that certain fundamental factors, without which there can be no balance in load building, have already been re-

ceiving careful study. Thus, if this discussion is to be limited to industrial, commercial and domestic loads, it implies that other loads, such as railroad electrification, have known load characteristics and are being supplied under conditions which fit into a utility's entire business. In like manner, the shapes of load curves must be known, and the prices of competitive fuels must have been determined.

If the reasonableness of the foregoing assumptions as a starting point is granted, and if the necessary basic information on load characteristics is available, it should be possible for any utility to determine its best practical load balance between classes of service for normal business conditions. This has been done, undoubtedly, by many utilities, but, in this specific illustration, reference is made to the printed but not published paper by Constantine Bary entitled "Economic Significance of Load Characteristics as Applied to Modern Electric Service."

It is important that it is possible to express in a simple formula the most economic balance in the volume of annual sales between the domestic, commercial and industrial classes of service. The exact formula* arrived at is perhaps not as important as the fact that it is possible for any utility to determine for itself a similar general relationship.

Although a formula is always a bit terrifying, this particular one can be greatly simplified by making the reasonably accurate further assumption that commercial sales are equal to domestic sales. When this is done, it may be said that for every 1 kwhr sold annually, in the combined domestic and commercial classes, there must be sold 3 1/3 kwhr annually in the industrial class of service, in order to obtain the most economic balance between these loads. Surely, this is an easily enough understood selling goal for anyone.

It is true, however, that this relatively simple answer to the problem was obtained through making a number of assumptions. What would be the answer, for example, if, instead of assuming that the shapes of each class of service load curves remained unchanged for all volumes of added load of each class, a definite change in the shape of the load curve for one of the service classifications was assumed to be a reasonable future reality? Such an answer can be also easily obtained for the case being discussed and likewise is obtainable for any utility if the necessary basic information is at hand.

Thus, if it is assumed that the shapes of the load curves, and the general load characteristics of the commercial and industrial classes of service, remain unchanged, and if it is further assumed that the domestic class of service changes its load curve shape and general load characteristics to those that would be obtained under a 50 per cent range saturation, and 30 per cent completely off-peak water heater saturation, the most economic balance in loads, under these conditions, may be expressed by another relatively simple formula.** With the further generalization that the commercial kwhr sales are equal to the domestic, it may be said that for every one of the annual kilowatthours sold in the combined domestic and commercial classes there must be 2 1/3 kwhr sold annually in the industrial class of service to obtain the most economic balance between these loads.

Although this discussion may be too complicated already for a presentation of this kind, it has been included in this paper in order to show the relative ease of obtaining safe present and future guideposts to balanced load building. It may be summarized as follows, remembering that it applies only to a single case which is being used to illustrate a satisfactory method of analysis:

If it is assumed that for a number of years to come the shapes of load curves of industrial and commercial classes of service will remain practically unchanged notwithstanding changes in the volumes of these classes of business; if it is further assumed that the major change in the domestic field will be due to the acquisition of electric range and off-peak water heater loads, on the basis of the most economic relation between them, which, for the specific case being studied, approximates two ranges to one off-peak water heater; if it is also assumed that the volume of commercial sales will about equal those of the domestic class; and if reasonably good business conditions can be anticipated, then the best economic balance between the loads of these classes is obtained when the annual kwhr of the industrial class are between two and three times the sum of commercial and domestic sales, gradually approaching the lower figure as the volume of domestic sales increases.

At once, of course, there come objection to any such analysis. It is apparent that business depressions will recur, that rate changes, often involuntary and improperly directed, may be made within each class of service, that business will be available that must be taken regardless of its effect on load characteristics, and that general desires of a market are not subject to rigid control.

Nevertheless, the direction of sales pressure should be toward the building of load which sets up a trend toward the goal. Whatever the degree of accomplishment may be, it will represent improvement. Disregard of this need for directed, intelligent sales pressure will invariably result in uneconomic distortion of the load relationships of customers within classifications and between the several classifications themselves. It will adversely affect net income.

Another practical application of striving toward a balanced load can be found in a consideration of the effects of different loads on the economics of a utility system under depression conditions. Obviously, at such a time the industrial load is susceptible to large decreases, and therefore precludes the acquistion of such load in volume sufficient to provide desired theoretical relationships. Consequently, the effects of a business depression are least when the industrial load consists of highly diversified types of business. Studies indicate, for a large metropolitan system, that while, during 1932 and 1933, certain types of larger wholesale load decreased to 50 per cent of their pre-depression volumes, the group as a whole at no time reached a value of less than 95 per cent of its pre-depression sales. It goes without proof that from the standpoint of load diversification and of maximum safeguarding against the effects of depression, it is better to acquire one hundred 50-kw industrial customers than one 5000-kw customer, if the latter's use of electricity is apt to fluctuate materially with business conditions. It is even conceivable that there are utility situations where the business of a customer of the latter type should not be actively solicited.

So far, this discussion has dealt, of necessity somewhat sketchily, with re-

---

* Actually, based upon the class of service load characteristics contained in the paper:

$$Z = 3.5 + 3.2q$$ (Applicable within practical limits of Z and q)

where:

Z = ratio of $\frac{\text{Annual Industrial Kwhr Sales}}{\text{Annual Domestic Kwhr Sales}}$

q = ratio of $\frac{\text{Annual Commercial Kwhr Sales}}{\text{Annual Domestic Kwhr Sales}}$

** $Z = 1.08 + 3.62q$ (Applicable within practical limits of Z and q)

where:

Z = ratio of the $\frac{\text{Annual Industrial Kwhr Sales}}{\text{Annual Domestic Kwhr Sales}}$

q = ratio of the $\frac{\text{Annual Commercial Kwhr Sales}}{\text{Annual Domestic Kwhr Sales}}$

quirements for balanced load building as determined between different classes of customers. The matter of load building within each class of service is equally important and assumes particular significance in considering effects of rate reductions which too frequently are limited to a single class of customer.

Load building within each class of service, in general, should be directed toward improving the class load factor, unless the results of such an improvement affect adversely and substantially the economic balance between classes of service. If such a condition is true, it is often desirable, through properly directed sales effort, to arrive at a new balance equally as desirable as the former one. On the other hand, business of customers with low load factors may not be undesirable under all conditions of operation and, conversely, loads of customers with very high load factors may not be desirable at all times. The important point is that the sales effort should not be toward quantity of business only but should intelligently follow a plan leading to a more balanced system load.

In addition to load factor considerations, another group of customers, within a single class, that should be carefully considered before unusual effort is expended in obtaining its business, is that having thermodynamic characteristics which are not conducive necessarily to customer economy with Central Station service. Such business can seriously upset balanced load conditions if it is acquired or retained under conditions (for example, a rate based too much upon increment costs) which jeopardize the earnings from other customers in the class or from other classes of service. A special case of this same kind of business is one where the load, after having been acquired, will, when all factors have been taken into account, not result in permanent benefits to the customer under competitive conditions from other forms of power or fuel.

There is, however, a solution, more constructive than not soliciting the business, to the problem offered by electricity use in a given class of customers which, because of load factor, thermodynamic considerations, competitive fuels, or other conditions, proves to be undesirable. Instead of not attempting to get such business, or letting it go after it has been acquired, every effort should be made to determine whether or not, combined with some other load which can be obtained, the two pieces or types of business may not together be found to be definitely profitable. The simplest illustration of a condition of this sort is perhaps found in the residential class of business and involves the electric range and off-peak electric water heater loads. Many studies have been conducted recently that seem to show that, although the electric range load by itself is not particularly desirable at the rate levels required competitively by this service; when it is acquired in combination with off-peak electric water heater load, in some pre-determined ratio which is known to be most economic, the combination of the two loads produces a satisfactorily balanced and highly desirable situation. Another most important example is the sale of electricity for light in balancing loads in all classifications of business.

Still another phase of the load balancing problem within a particular customer classification is presented by the so-called profitable and unprofitable customers. These are usually found in the domestic and commercial classes, within each of which there may be one or more rates. Customers will cluster in groups along these rate curves, in locations dictated by ease of selling, unless the sales effort is directed definitely toward balancing the use of the rate. While there can be no question that it is important to increase the electricity use of the relatively prosperous profitable customer who has been completely sold on the value of the utility's service, it is even more important to bring the low revenue, less prosperous customer and the unprofitable customer into the frame of mind which causes them to admit the economy and desirability of increased usage and ultimately results in substantially increased sales to them.

The unprofitable customer is not by any means limited to the low use or minimum bill consumer. Particularly during recent years, pressures entirely beyond utility control have created areas in many rates which represent unprofitable business among larger volume users of electricity. Selling should be directed to avoid such areas or to remove customers from them to more desirable operating conditions, until such time as these undesirable rate conditions can be changed or until over-all load characteristics become such that a new and satisfactory balanced load condition makes them compensatory.

It seems hardly necessary to more than mention, here, that rate conditions should be available which attract customers into operating periods that are desirable from the viewpoint of improving conditions within the classification. Such rate conditions are, off-peak, seasonal, and night service provisions. The electric water heater has already been pointed out as a desirable off-peak load builder in the residential class under certain conditions. Many other examples come to mind at once. As a matter of fact, the demand form of rate is in itself a method to accomplish this result.

Rate reductions should always be made with over-all system load conditions in mind, so that disproportionate development will not be promoted. Perhaps one of the greatest dangers in the utility business, during the recent past and at present, is the fact that many rate reductions, through no desire on the part of the utilities involved, have had to be made to those customers who least deserve them or to too great an extent to the residential class, with consequent severe disruption to balanced load conditions. It is not enough, in such cases, that the methods used to regain sales balance be aimed at a present necessity in one classification. Such selling may even make a bad situation worse. The proper corrective measure may be the balancing of that selling by vigorous sales pressure among customers of an entirely different classification. Or, it is even sometimes true that the best answer to an apparent residential load necessity, for example, is intensive development of the commercial and industrial loads.

A market approach of this kind obviously calls for a sales organization which lends itself to directional control in a very high degree. It also requires accurate and detailed knowledge of the market, which in turn calls for constant testing and analysis to determine the characteristics of individual and combination loads and for a wide knowledge of the equipment available to satisfy the requirements of the market. With particular reference to costs of residential service; to the volume of gross revenue that must be obtained to completely offset earnings lost through domestic rate reductions; and to the necessity for keeping bottom steps in residential rates sufficiently above cost to offset losses inherent in the low use customer, reference is made to several recent studies on these subjects by Edwin Vennard, Vice-President of Middle West Service Company.

Each customer prospect represents a problem in selling new equipment or in

(*Continued on page* 327)

Human Inter-Dependence

By Dr. Adam S. Bennion
Assistant to the President, Utah Power & Light Co.

An address before the Third General Session of the Seventh Annual Convention of the Edison Electric Institute, New York, N. Y., June 8, 1939

SOMEONE has said, "In the last half-dozen years public utilities have been in their Gethsemane." Pessimistic men can see beyond the garden only the crucifixion upon the cross of governmental competition. More courageous men can see beyond to an institutional resurrection through which the utilities will be born into a new life far richer because of the difficulties through which these institutions have gone.

Certainly we have been going through critical days. In such days human responses are altogether natural: we complain, we criticize, we condemn, we threaten, we "coerce," we "appease." We seem to have tried everything except to cooperate. And yet in our pulling together lies the only solution to our present difficulties. Crises finally drive us to an appreciation of the fact that we are all part of one another. It is a great day when we make that discovery. Every athletic team which has achieved championships has learned that fundamental truth. Every home which has been successfully established has rested upon that foundation.

There is nothing new in that suggestion. May I quote:

"But now are they many members, yet but one body.

"And the eye cannot say unto the hand, I have no need of you.

"Nay, much more those members of the body, which seem to be more feeble, are necessary:

"And those members of the body, which we think to be less honourable, upon these we bestow more abundant honour; and our uncomely parts have more abundant comeliness.

"For our comely parts have no need; but God hath tempered the body together, having given more abundant honour to that part which lacked.

"That there should be no schism in the body: but that the members should have the same care one for another.

"And whether one member suffer, all the members suffer with it; or one member be honoured, all the members rejoice with it."

—I. Corinthians 12:20-26.

DR. BENNION

Those are not just spiritual truths. They are economic and sociological. They are as true today as when they were uttered. In days of stress people have been assured there were short-cuts to prosperity. They have been led to believe that there were new recipes for success. It is our job to help people to understand that most panaceas are unsound and that civilization has discovered no new plan for achieving human progress. Our government has worked to a pattern set up 150 years ago. Under that pattern it has achieved an altogether glorious record. In my judgment it is the greatest story ever written into the chronicles of time. Time forbids a setting forth of the evidence which warrants this conclusion. But it is my conviction that once the American people realize the danger which their civilization now faces they will rise to the rescue of the American pattern of living. Together our forefathers established Plymouth. Working together they extended America beyond the bounds of the original 13 colonies. Under bonds of common fellowship my own people trudged a thousand desert miles to establish homes in the Rocky Mountains. I know what teaming together has meant in my own State. Human interdependence needs to be realized anew in three distinctive fields.

I. American Industries Themselves

No institution stands by itself alone. We succeed because other industries succeed. I am recently returned from San Diego, Calif., into which port the Pacific Fleet has just returned. What a difference to the life of that city 66 battleships can mean. My own State of Utah is largely a mining state. When the mines do not operate the smelters are closed down. When the smelters do not run the railroads are crippled. When those three institutions suffer, farmers lack a market, shops of all kinds are in despair and homes suffer the disaster of being without funds. A power company feels the consequence in all quarters. The grocer, the printer, the hardware store, the dry-goods establishment—all of these suffer together. The scripture is fulfilled in their experience. Banks have been forced so to lower their interest that a man with ten thousand dollars in a savings account now receives from it one hundred dollars a year—eight and a half dollars a month. Insurance companies have had to make adjustments in their annuity policies carried forward on a monthly basis. Let me quote a typical summary of the last 14 years:

"In the seven years, 1925-1931, the American people invested about 33 billion dollars in business corporations. These billions went into plants, tools, equipment and other facilities for producing and distributing goods.

"They were like the seed sown in a friendly and fertile soil and they yielded a bounteous harvest—a national income approaching 80 billion dollars a year.

"This was a period of surpluses, instead of deficits, a period of employment, rather than unemployment. Payrolls were long and wages were high. Instead of going up, the

national debt was going down. Taxes were lowered instead of raised.

"What happened during the next seven years, 1932-1938?

"Investment in business corporations dropped from 33 billions down to 4 billions. Instead of investing an average of nearly 5 billions a year in launching, expanding and improving business enterprises, the American people invested only 600 millions.

"Business went into a tailspin and has not yet fully recovered from the 'jitters.' The national income went down and the national debt went up to the highest pinnacle it has ever reached. More taxes were collected than ever before in time of peace. Unemployment became a chronic national ailment."

Piling up governmental debt does not answer problems like these. Mutual complaints and bickering can offer no solution. In some way we shall have to restore business confidence and shall have to release industrial energy to venture into new undertakings. Now, as never before, responsibility rests upon business to explain to the people of America—and most of them work for some kind of business institution—that excessive debt is ruinous, that penal taxes drive money into the cellar, that threats and punishments and reforms do not promote business activity; that under the American plan of success rests business success. It is clear to me that we can do two very concrete things. We can sit down with representatives of all kinds of business—retail stores, supply houses, railroads, banks, insurance companies—around a common table so that we all move forward in an effort to see that all of our customers come to understand fully a few economic principles. Second, we need to see that our own employees understand fully these same principles, and that they reach out in a friendly way to spread a common understanding. I have absolute confidence in the fairness and good judgment of the American people. I have full confidence, too, that upon a basis of full understanding they will swing back away from unsound theories and unproved experiments. Let's make a common approach in terms of sound business to our outstanding business problems. My first thought under the theme of human interdependence is that all business is interwoven. All businesses rise or fall together. In a common defense the people of America should be led to an understanding of the only solution of their economic problems.

II. Capital and Labor

There is a second relationship of human inter-dependence which goes to the heart of every American business. It is the relationship between capital and labor. Whether you call it capital and labor, or management and men, the problems in that field are very real. No one can read the press of the last three years and not appreciate just how serious all those relationships are. The answer lies not in an indictment of business and not in epithets against unions. The answer lies not in being unionized or not being unionized. The relationships go deeper than that. Business no doubt in the past has made its mistakes. Perhaps labor has also. But those mistakes and the consequent ill-will growing out of them, can offer little hope for our future progress. Again the matter is for greater understanding. We need to appreciate more fully the responsibilities of management and of capital—and of labor as well. The New Deal has achieved one notable result. It has made us more conscious of our social obligations. Men are worthy their hire. They are entitled to adequate compensation. They are entitled to a sense of security in their jobs—and against illness, and against old age. As a result of the New Deal these problems will never be viewed again as they may heretofore have been looked upon. We need to understand also the responsibilities of management and of capital. Some theorists would have us believe in the equal responsibility of the laborer and therefore his rate of return should be equal to that of the manager. But capital is more than money. It involves creative ideas—it involves management. It involves the courage to venture into unknown fields. It involves so many things which make labor possible.

I have been interested in the experience recently of a fellow townsman who has opened a little flower shop on Main Street of Salt Lake City. Asked the other day how he viewed this matter of venturing into business, he said: "Well, I don't know how I am going to make it. It is tougher going than I had thought. First of all there is rent, and then I have to ship in my flowers. I have the matter of sales and of spoilage. Now I discover that the problem of collections is very real. And I have no assurance that a good, strong competitor may not come in to run me out." Compare the responsibility of that man with the responsibility of the girl who gives her services behind the counter. Capital and labor are mutually dependent but they are entitled to returns in keeping with the responsibilities borne and the contributions made toward the net return. Together management and men need to sit down around a common table.

For the past six months our institution has been attempting to do that very thing. We have been unionized, and so I speak out of no animosity toward labor unions. They have played a wonderful part in the evolution of conditions under which men work. Together I am sure we can analyze the elements which ought to determine the proportion of returns which should go to:

The payment for the use of money.
The rent of buildings.
The purchase of equipment and maintenance and up-keep of that equipment.
The salaries and wages.
The taxes and the many other costs of carrying forward a modern business.

It has been as challenging as it has been fascinating in the last few months to attempt to discover what various types of work should be paid. Management and men together can build great institutions. Failing to work together they can wreck the best of institutions. The problem of human inter-dependence in the field of capital and labor is one of the most intriguing and one of the most promising studies before the men of America today. Threats, and walk-outs and strikes, on the one hand, and arbitrary dealings, and ruthless firings on the other are all poor weapons with which to make progress in a modern world. We need once more to remind ourselves "And whether one member suffer, all the members suffer with it: or one member be honoured, all the members rejoice with it."

III. Government and Business

May we touch, all too briefly, upon a third major problem in the field of human inter-dependence. In many respects it is even more threatening than either of the other two. I refer to the relationship, the human relationship between government and business. I recently listened to Everett Dean Martin make one of the most stimulating statements relative to government that I have listened to in a long time. May I quote:

"There is a psychological law of government. The law is this: all government tends to expand itself at the expense of the lives, liberties and property of the members of society. This law applies to all types of government, democracy included. Government will respect its own people only when it is obliged to do so. This is why 'eternal vigilance is the price of liberty.' It is why our fathers were so careful to devise a constitution granting limited powers to office holders. This is furthermore one reason why parliaments for which most planners have little regard, came into existence. Men knew that to keep government just and free they must keep it small. Give it favors to grant and it will have its favorites prospering at

the expense of its 'forgotten man.' Hence to keep government small, the citizens must keep it poor. Thus Montesquieu said that parsimony is a necessary republican virtue. Our British predecessors knew this, and out of it issued the quarrel between the crown and parliament. English liberty was preserved because Englishmen insisted that taxes be voted by their own representatives in the House of Commons. Parliament was a device whereby the public could pull the purse strings on government spending. Hence it was a check on the expansion of government and a blocking of the road to despotism.

"But suppose a people begin to think of government as a storehouse of plenty and look to it for a plan which will satisfy all demands. Suppose in the words of Dostoievski, Grand Inquisitor, they cry, 'There is no freedom, there is only hunger!' Then it becomes possible for government to expand itself, tap new sources of revenue, get more politicians on the public pay roll, build up a party machine large enough to keep a party in power and crush its rivals. Then it becomes possible for a government to corrupt the public with the public's own money. For then public sentiment, instead of pulling the purse strings on government to check its expansion, runs in the same direction as the politicians' desire for more revenue and greater power. Then there is no popular check against tyranny."

When you next go out to the Fair you will be interested to examine the copy of Magna Charta there on exhibit. As you examine this document, and as you turn back once more to the work of our own constitutional fathers, you will recognize the great hazards that attach to too much government. Certainly the relationship between government and business is tremendously real. It is inevitable that the activities of government should be multiplied. We, the people, demand of our government so many benefits. All too frequently as we make these demands we forget that to secure them we must not only pay for them, we must give up liberties that may stand in the way of their realization. I am mindful, too, that the government has achieved many wonderful results. Our postal service, our highways, our educational and governmental institutions all bear eloquent witness to the worth of governmental achievement. And I have a conviction that there are things enough for the government to do in its own sphere that it ought not reach out to rival and to crucify agencies which have pioneered themselves into a successful field of operation. We hear frequently that the government can do this or that thing—that it can, for instance, run the railroads—of course it can. The government can run the railroads. It can run the banks. It can offer insurance. It can clothe the people of this land, as it can feed them. But the minute the government does all those things, we have a totalitarian state, democracy is a memory and the genius of the American pattern of living is destroyed. The issue in this field of human interdependence is not merely the taking over of some one particular agency. It is the threat of the destruction of the American way of doing things.

In the few minutes that are left me may we turn to the problems which immediately involve the electrical industry. I can conceive of three reasons why the government might step into our field. In the first place the government very properly may launch upon a program of reclamation, or of flood control. Incident to such a program, dams are built and the problem of power is presented. There is no reason why power should not be produced in connection with such undertakings. There is no reason why the American people should not enjoy that power. But once the power is produced, the government does not need to crucify the agencies which have already been set up to distribute it. I suggest that it is better economics—it is more American—for the government to sustain and make use of agencies that have already been set up. I need not weary you with the complications which are developing out of another plan which has been followed in the territory of the T.V.A. The destruction of American institutions does not finally promote American progress. We gradually discover that the loss of taxes and the setback that attaches to destruction of worthy enterprises more than off-set any claim that might have been made for a yardstick—which does not measure.

In the second place, the government might step into our field because "costs are out of line." But you do not have to wreck an institution to get those costs into line. Certainly it is easier to determine what power should cost in New York, or in Wyoming; up in Seattle or down in Los Angeles. After all, the electrical industry has done an altogether outstanding job in the field of costs. If it were not too critical, it would be interesting to compare the development of cost in the field of power as against costs in the field of government in the 30 years between 1909 and 1939. In the industry with which we are connected costs have been reduced, roughly, for residential use from 20c. a kwhr to 4c. In those same years the governmental debt has increased from one billion to forty billion. I do not press the comparison. I make the point merely that on the score of costs the electrical industry merits something better than crucifixion. Lowered costs can finally be better achieved through a program of cooperation between government and industry, than from any plan of rivalry that I can comprehend.

In the third place, government may step into our field in an effort to serve those people in remote corners of our frontier who have not been served. Those people are so scattered that it is clear to any body who studies the problem that no business venture can serve them in the name of business. It is a fine thing to have those people live on the frontiers. I salute them and appreciate their fine courage. I have no quarrel with the government's undertaking to help them to enjoy the advantages of modern society. But again with the matter of subsidy—and it is perfectly clear that they cannot be served on a mere cost basis—let that subsidy be offered to the people direct or let it be provided through existing institutions that are perfectly willing to serve them but which cannot do so in justice to the principles of sound procedure. The electrical industry cooperating with the government will be only too glad to reach out into whatever remote corners may be designated. It will be a great day when the government says to industry: "We appreciate what you have done to date. We recognize your limitations. We plan to join with you to help to extend your frontiers. We are going to help people to enjoy what you have to offer."

And so in the spirit that has made America the outstanding nation in the world today, I submit for your consideration the wisdom of an extended appreciation of our human inter-dependence—that industries under a common problem may proceed toward a common answer—that capital and labor may join hands in a program which carries them both forward—that government and business may cease mutual indictments and adopt a plan under which business will sustain government and government in turn will sustain business. In no other way can progress be achieved.

Let us make sure while we still have America—the land which with 6 per cent of the population of the world in 6 per cent of its territory now enjoys 44 per cent of the wealth of the world—let us make sure that we shall not squander our inheritance and wreck the scheme which has brought us the enjoyment of the richest living the world has ever known. Let's preserve the genius of the greatest nation in the world.

What the Customer Thinks of Utilities

By Elmo Roper
Distribution Consultant, New York, N. Y.

An address before the Third General Session of the Seventh Annual Convention of the Edison Electric Institute, New York, N. Y., June 8th, 1939.

I HAVE been asked to discuss the subject of what the customers think of utilities. It is a reassuring sign of returning confidence that utility executives now think that what the public thinks of utilities is fit to print! I think it is also a hopeful sign that there is a greatly increased number of utility executives who regard the public's views toward utilities as worth listening to.

But to accurately analyze what the public thinks about utilities is not an easy job. It is not so simple, for example, as it is for the Waldorf-Astoria Hotel to find out what its customers think of it. The situation is complicated by the fact that this customer of yours does not form a single judgment about you; he forms three separate judgments, and what he finally winds up thinking is a composite of all three judgments.

In the first place there is the judgment he passes on you when he thinks of his relations with you on a strictly buyer-seller basis. In this judgment, your prices and your service are important.

But the customer also forms a set of judgments about you as a neighbor. And bear in mind that he is often confronted with having you as a neighbor whether he wants to or not. In this set of judgments the courtesy and the other neighborly qualities you show are important.

The third set of judgments which your customer forms about you has to do with you as a citizen. And you are no ordinary citizen like John Smith, but a citizen of such great importance that your activities and your welfare are as much a matter of national concern as the welfare and activities of our army and navy. Translated into local terms, you are regarded as being able to help or hurt your town—which is also your customers' town.

Your customer has definite reactions as a buyer, definite prejudices as a neighbor and equally definite ideals as a citizen. And he is judging you as a seller of a commodity he needs, as a neighbor he has to live with and as a citizen of his town.

MR. ROPER

Consequently, any worth while approach to the subject at hand must explore the reactions of this customer as to his views about both himself and you as citizens or neighbors. Before we shall be in a position to understand what the customer's reaction toward utilities is, I feel we must know something of the present state of mind of the public toward government and toward social and economic problems.

I shall try to outline briefly my conception of that state of mind. I realize fully that a political speech is not indicated here and, to reassure you, I have no intention of giving one. But the present state of the public mind can best be appraised by the inclusion of some reference to its reaction to certain present-day political figures and issues. In giving this bird's-eye view of some facets of the public's mind, I have borrowed information from a large number of studies, or polls, which we have done for *Fortune Magazine,* the National Association of Manufacturers, several utility clients, and at least two other industries which have made an approach as an industry to the problems concerning them. Some of these studies have been published, some have not. But as they have filtered across my desk, they have given me what seems to me to be a fairly clear picture of the public mind. My conception of the state of this mind is, of course, subject to error in interpretation; but it at least has the merit of being based on more than one type of approach to the subject.

Suppose we start with an analysis of what the public really thinks of President Roosevelt and what he's been trying to do. To begin with, they like his personality. They agree with, and want, most of his announced or implied objectives. They think he is honestly trying to better the conditions of the average citizen. They thought in 1932, again in 1936, and still think—although by a decreased majority—that he is the average citizen's best bet in the White House. They like the idea of unemployment insurance, old age pensions, and collective bargaining. In general they think the greatest issue confronting this country today is not excessive government spending; is not the possibility of a major war; is not the threat to capitalism posed by government ownership. To them the greatest issue confronting this nation is greater economic security for all of the people. Any leader who honestly strives toward that goal can make many mistakes in methods and still be forgiven. But "forgiven" is the word; the mistakes are not unnoticed. This distinction in terminology brings us to the other side of the picture of the state of the public's mind toward Mr. Roosevelt. The public did not like the proposed Supreme Court bill, nor did it approve the appointment of Senator Black to the bench. The public did not like the purge. The public does not like the President's advisors. All of these, and other mistakes—largely in methodology—the public has noted and marked down on the liability side of the ledger.

The public wanted the reforms it has got, and was perfectly willing to forgive some of the methods by which it got them, but today it says: "We've got enough reforms—let's consolidate our gains. Let us, when we again have the choice, see that the direction of our government is in the hands of some one who will not seek to undo any of the real reforms which have been accomplished, but who also will try to get the present ones working smoothly and will not try for any more—for the present at least."

All of this summary of the reaction of the public toward its present head of government gives us a good cornerstone from which to piece out our picture of your customer as a citizen. Now let's see what the public thinks of labor. Well, in short, it likes labor, and it doesn't think labor gets paid enough. It thinks labor should have the right to unionize, and that any employer who fights the *principles* of unionization is stupid. But it also thinks unions should be incorporated and should be as legally responsible for their acts as any other corporation is. Also, when asked which of the following four is most in need of reform, the public voted as follows:

The Supreme Court.... 5%
The Stock Exchange....13%
The Public Utilities....14%
The Labor Unions.....39%

Finally, it thinks that labor, largely through some recent unwise leadership, has finally caught up with capital as to the extent of its misdeeds, and is today equally responsible with capital for such misunderstandings and disputes as now arise.

Let us now examine a rather motley and apparently disconnected set of public reactions. I shall list a number of them, making no effort to coordinate them into a set pattern, but rather for the purpose of piecing out and throwing some light on other facets of this complex creature—your customer.

For every person who thinks the members of Congress are so busy thinking of their own political future that they have no time to pass wise legislation, there are three who think Congress is about as representative a body as it is possible for a large country to have.

Well over half of all the people with ideas on the subject would have every government appointment below the rank of cabinet office subject to Civil Service competitive examinations.

Two-thirds of the people think there is likely to be a major European war within the next two or three years and three-fourths of them think the United States will be drawn into it. Eighty-one per cent of all of them approve increased expenditures for our army and navy.

Our people are strongly for compulsory sterilization of mental defectives and habitual criminals, but are against allowing doctors to make mercy killings of infants born mentally or physically handicapped.

Roughly two-thirds of the public think there should be no top limit on what a man is allowed to earn—even a majority of the poorest agree to this. Nor do they think our tax system should be used as a device for redistributing wealth. They regard the sales tax as the most unjust tax of all; the income tax as the most just—even those who pay an income tax agree to this.

Three-quarters of the people think the government should provide free medical and dental care, at the expense of the taxpayer, for those who need it and can't afford to pay for it.

Over half the people—despite our unsettled economic conditions—feel that today any young man with thrift, ambition and ability has an opportunity to rise in the world, own his own home, and earn $5,000 a year or more. And here's a cheerful note: most of the youngsters—under 19—think that if such an able-bodied person doesn't achieve a self-supporting state, it is his own fault, and no fault of our system.

Now let's turn to an examination of what the public thinks of big business—because you are big business and it might be well to see where you stand in relation to other big businesses. To begin with, the public has no quarrel with big business because it is big. In answer to a question calculated to establish the merits of big vs. little business, as assets to our national life, the vote was two to one for keeping large corporations intact, against the proposal to break them up into smaller units. On another occasion we asked which was generally fairest to their employees, large corporations or small business. The vote was close, but slightly in favor of the large corporations.

In the minds of the public the Ford Motor Company is the closest to an ideal American business there is, and Henry Ford is closest to an ideal industrial leader. Incidentally, there are two reasons given for this: he treats his labor well and he offers a good product at fair prices. The net of the public's reaction is that most industrialists are good, and some are bad, but size makes no difference in whether they are good or bad. However, the officials of most big businesses are regarded as overpaid, whereas officials of smaller businesses are regarded as being paid fairly, or even too little.

One of the arguments currently raging most fiercely which has to do with the whole question of corporate life, particularly as it applies to size, is the question of what we shall do with our chain stores. We gave the public a chance to vote on this question with the following results: more than a fourth said that chain stores provided such great values that they not only should not be penalized in any respect, but on the contrary were deserving of wholehearted public support. More than a third said in effect, "Don't help them, and don't hurt them. Leave them alone to make what profits they can." Another fourth of them said that since they had buying advantages over local independents, they should be forced to pay some special tax, but just enough tax to compensate for this buying differential. Only one in 14 voted that they should be done away with, either by means of legislation or confiscatory taxes. Apparently Mr. Patman is not going to have the complete public support for his proposal that he visualized.

In all the studies we have done, one of the most significant things which appears is the public's liking for the competitive system. It seems to be deeply rooted in our consciousness that "competition is the life of trade," and I suspect our public would go even further and say that industrial America as it stands today is the *result of* the competitive system. So interested is the public in the preservation of competition that it is always alert to any suggested encroachment. In a certain ballot where it labeled as untrue a number of such statements as—that big business has been arbitrary in its treatment of labor; that it has opposed all reform movements; that it has made too much money; and that it has a take-it-or-leave-it attitude with its customers—it also voted by a decisive margin that big business *was* guilty of killing off competition by its pricing policies, and that it regarded this as an important evil.

In a certain poll we tried to find out which of several specified industries the public thought was getting too much, too

little, or about enough government regulation. Radio and the steel industry were singled out as getting about the right amount, but the public felt that the automobile manufacturing industry was getting too much and that life insurance and banking, and the electric utility industry were getting too little.

Whenever we have attempted to make inter-industry comparisons, we have been confronted with a great deal of consistency of thought on the part of the public. Their attitude seems to be that if it is something about which the general public has very little specific knowledge and yet is something the public has to have, a pretty high degree of government supervision or regulation is a desirable thing, even though it is in a field where some elements of competition are present.

If I had to summarize and name a spot into which I think you fit in the public regard, I should say that you are considerably below the manufacturers of automobiles, but were as least a full step above the bankers. In fact, I would hazard a guess that the public probably felt that most of the sins with which they charge you were committed in your name by the bankers.

Now I should like to borrow from more than a dozen studies which we have done directly in the utility industry for the purpose of rounding out this story of what the customer thinks of utilities. For obvious reasons I can't mention names and places because these studies were done on a confidential basis for clients who have given me permission to use such material as I have used, without reference to specific companies.

When I first started to do work for utilities, I took the trouble of making a rather exhaustive inquiry as to what constituted the prevailing philosophy of the management of the utility industry as a whole—which, fortunately for me, turned out *not* to be the philosophy of my new clients. These two things stood out as integral and important parts of that philosophy: "Don't worry about rates not being low enough because these governors and commissions are so anxious to make political capital out of rates that they are constantly on our neck to drive rates down and we have to constantly fight against *any* rate reduction in order to keep the rate situation in balance. Also don't worry if you find that people call utility rates high. All people call all utility rates high at all times regardless of a justification or a lack of it."

After several years' work in the field, I find myself completely opposed to both statements. In the first place, the majority of people are not apt to call utility rates high if they aren't high. We have asked the following question in communities scattered all over the United States: "Do you regard the monthly cost to you of the following services as high, low or reasonable?" and we have named the light bill, the gas bill, the water bill, the telephone bill, and the tax bill. Except for some confusion over the fairness of the telephone bill, we have found that by and large people have rather unerringly put their finger on high rates, and have been perfectly willing to call rates reasonable when they actually were reasonable. True, we have found very few people willing to call any of these costs low, but they have used the word "reasonable" in describing them in every single instance where I personally consider the costs of these services as being reasonable. In the Puget Sound district, for example, where there are actually low electric rates, many more people called the electric bill low than called the telephone bill, the tax bill, the food bill, or the rent bill, low.

I think it would be interesting to examine briefly at this point the question as to who it is, what kind of a person it is who is critical of big business generally, and the utility business specifically. I think that if I were to select the single greatest mistake most often made by clients of mine who represent big business, I should say that it was the assumption that their public relations' policy had as its primary concern the poor people, "the people who have nothing except a vote," to borrow a phrase. They make the blithe assumption that the intelligent people—the doctors, lawyers, and other professional people, and those others with sufficient money to be in the A economic level—that all these people are on the "right side" in that they understood the problem and that they are people business can safely regard as allies in any struggle against increased government regulation, or in any battle at the polls. I say this is the most serious mistake advisedly, because I have not found that condition to be true. Time after time our cross-tabulations have revealed that the severest critics of certain big businesses are the most educated groups, the professional people. It has been said that all political revolutions start at the top and spread to the masses. It is my opinion that all effective demands for business reform start also at the top. Perhaps some of the politicians who seem to be embarked on an anti-business plank as a means of rabble-rousing have investigated and found that a considerable percentage of their most intelligent electorate is to be found among the critics of whatever business practice is under fire at the moment.

Some time ago we tried the experiment of asking the following questions in a number of studies we did for utility companies. It was our thought that the answers to these questions might prove more significant in their cross-tabulations than in their straight results. One question was our old one about "Do you regard the cost to you of the following services as high, low, or reasonable?" and in that list we named the electric company, the gas company, the water company and the telephone company. We also asked which of these companies gave the most courteous treatment to customers and which gave the least courteous treatment. We then asked which one of these companies stood out as being the most active in promoting the general welfare of the city and which stood out as being the least active. We also asked whether the public thought the city would be better off if it, or some other branch of government, owned any of these utilities and, if so, which one especially.

Our cross-tabulations on these questions have provided what is to us a very interesting discovery. First, let me say that the people have very definite ideas as to which utility gives it the most courteous treatment and which gives it the least courteous treatment. Second, they have very definite ideas as to which company is the most and which company the least active in promoting the civic interest; but it is in the cross-tabulations where the real news comes. Let's take one un-named city and look at the results to each of these questions. In answer to the question on costs 35 per cent of the people called the cost of electric service high and a similar amount, 30 per cent, called the cost of gas service high. It is not easy to keep percentage figures in mind, but remember that a substantial number called both services high, and a few more called the electric bill high than called the gas bill high. But in answer to the question about

where they get courteous treatment 48 per cent picked the light company as giving the most courteous treatment and only 8 per cent picked it as giving the least courteous treatment. On the other hand, only 7 per cent picked the gas company as giving the most courteous treatment and 47 per cent picked it as giving the least courteous treatment. In short, the electric company was pretty generally regarded as giving courteous service, and the gas company was not. In answer to the question as to which company stood out as being most active in promoting the general welfare of the city 60 per cent picked the electric company; 9 per cent picked the gas company. So up to this point we have learned that the electric company is regarded as more of a civic asset than the gas company, and gives more courteous treatment than the gas company, but that a few more people call the electric company's bills high than call the gas company's bills high. In the next question we may have some clues as to what prompts a desire for municipal ownership. When we asked if the people thought the city would be better off if it owned one of the four utilities, and if so which one, 31 per cent named the gas company; only 4 per cent named the electric company.

Apparently being a good neighbor—as exemplified by courteous treatment—and being a good citizen—as exemplified by activity in promoting the welfare of the city, weighed more heavily in the minds of the people than did the question of the pure buyer-seller relationship, as exemplified in rates. Of course, it must be remembered that there was no great outcry against the rates of either company in this particular instance.

Now let's look at some of the cross-tabulations, and, fearing that you may have as much trouble carrying percentages in your mind as I do, I shall try to proceed slowly. Of those few people who labeled the gas company most courteous 43 per cent also called it most active in the civic sense, but of those many people who labeled the gas company least courteous, only 3 per cent called it most active in a civic sense. Of those few people calling the gas company most courteous, only 19 per cent called the gas bills high, but of those many people who called the gas company least courteous, 47 per cent called the gas bills high. Only 16 per cent of the people who called the gas company most courteous said it should be owned by the city, but 48 per cent of the people who called it least courteous said it should be owned by the city.

Thus there is established a definite relationship in the minds of the public between courtesy, civic activity, reasonableness of rates and municipal ownership. As a matter of fact, the effects of being a good neighbor and a good citizen are even broader than that. We asked whether they regarded the meters of these companies as honest and dependable and while 14 per cent questioned the electric meters, 40 per cent questioned the gas meters. Apparently it is with great difficulty that people believe bad things about their friends, even if their friends are public utilities.

We thought the views of people as to whether these companies were locally owned or owned by out-of-town interests might have some effect on their other views, particularly their views as to civic activity. Apparently judgment was being based, however, purely on merit and regardless of where the ownership rested because only 16 per cent regarded the electric company as being locally owned and 30 per cent regarded the gas company as being locally owned. As a matter of fact, neither one was locally owned.

What does this all add up to? To me it is another bit of corroborating evidence which fits in perfectly with other results of the last five years spent in probing the public's mind. Our people have faith in this country as a land of opportunity; they like the idea of an industrial or competitive society; they believe in competition, where it is possible, as a means of keeping business alert, progressive, and honest, and they believe in close government supervision where competition is not feasible as a means of achieving those same ends. They have faith in and respect for most of the people engaged in business and they have even greater faith in and respect for their own democratic system of government. They want to keep in their community good neighbors and good citizens—and they want to get rid of bad neighbors and bad citizens. They are the jury which will eventually decide what they want to buy, in what manner they want to buy it, how much they want to pay for it, and from whom they want to buy it. I regard them as a completely fair, tolerant and intelligent jury. Given a free and intelligent press and an equally free and intelligent radio as means of disseminating information, I would believe that the American public would sooner or later pass a fair judgment on any of you, on any other business, or on any politician.

As a matter of fact many of you in the electric utility business have improved, during the past five years, as neighbors and citizens and merchants, and our surveys show that the public is aware of that improvement and, in turn, is friendlier to you than it was some time ago. This statement is perhaps most graphically illustrated by this comparison: In May of 1936 we asked a cross-section of America whether they favored private or public ownership of electric utilities. Thirty-one per cent voted for private ownership. In March of 1939 we asked the question again and 42 per cent voted for private ownership. Not all of the balance voted for complete public ownership—in fact only 19.7 per cent so voted. The balance of the public either wanted *some* public ownership but not all, or didn't know what they wanted. Thus you would appear to have improved your standing with the public by nearly 35 per cent in three years.

War Procurement

(*Continued from page* 304)

the proper localities. In this way no money would be spent on needless or badly located plants and, under the existing scheme for control of war procurement, our industry will be able to install the new capacity certainly as soon as it is likely to be needed by those who have orders for munitions. Additional equipment for the transmission or distribution of energy should present no special difficulty since it takes less time to manufacture and to install than does generating equipment.

If this is regarded as too little in the way of preparedness and it is desired to go a step further, then let the government buy and store at selected localities, a suitable number of generating sets of agreed capacity, together with boilers, condensers and other important items of equipment, all in readiness for installation at the proper time and place, under pre-determined plans as just outlined. In this fashion, the time required for developing more power for war purposes will be still further reduced. This measure of preparedness will cost far less than the construction of power plants in anticipation of war. It is after all more or less in the same category as the storage of reserves of cannon, small arms and ammunition.

This is the extreme limit to which preparedness should go.

Forbes Prize Paper

Some Practical Aspects of Public Relations

By A. W. Conover

DURING the past nine years I have been in an executive capacity, operating small utility companies in the western part of the country. The small utility companies which we operate are located in eight states, and during the last year it has been my assignment to supervise public relations on all of our operating properties, in addition to the management of our Colorado company.

There have been numerous skirmishes with municipal agitation during the past eight years and also a few elections throughout the states in which we operate. We hope we have profited by our experiences in these elections and have endeavored to chart our course accordingly.

There have been scores of splendid articles written on the treatment of the customer, the handling of service, and on all angles of the public relations problem, which causes one to wonder what might be added to the subject. However the angle from which I would discuss the subject is "just what am I doing about the problem."

It has been my good fortune during the past fifteen months to have made several trips around the country in connection with my work. Wherever possible I have made a point of dropping into the offices of the utility companies in the various towns and cities to find out how contact people handle the public, and particularly a prospective new customer. Sixty calls of this kind have been made, and it is an interesting story on what I have found. I shall not attempt to go into the details, but my experience has given me some sound ideas in treating the problem on our own properties. One thing is true: All of us would be surprised to find out just what is happening on the front line.

I have discussed this problem with a number of utility executives during the past couple of years, and I find that in every instance the executive is in full accord with a worthwhile public relations program. I liken the situation to the churches of our country. Everyone will agree that they are most essential and have a definite part in the life of our people; yet the percentage of attendance is pathetic.

MR. CONOVER

Mr. Conover is the winner of the 1939 B. C. Forbes Prize. His career with the electric industry began in 1919 with the Philadelphia Electric Company in the Engineering Department. Three years later he joined the Virginia Railway and Power Company as Distribution Engineer.

In 1929 he became affiliated with the Crescent Public Service Company and the East Coast Public Service Company, taking over in 1930 the management of the Oklahoma and Kansas properties in this group. He was made Vice-President and General Manager of the Colorado Central Power Company in 1935 and was also in charge of the Oklahoma and Kansas group.

In the early part of 1939 he became Vice-President and General Manager of the Central Ohio Light and Power Company, continuing in the management of the western properties.

In my humble opinion, a public relations program, regardless of how splendidly it may be set up, is not worth the time spent in discussing it, nor the paper upon which it is written, unless the management and the staff practise it to the fullest extent.

The problem is basically the same, regardless of what part of the country you come from. Our people are just folks. I find that the employees of the utility industry are above average, and I also find that they are hungry for an understandable customers' relations program, one in which you and I shall wholeheartedly play our part.

We have all listened with great interest to splendid papers presented at utility conferences on public relations, and I have been interested in following the individual who made the presentation. Do we live what we preach?

Seldom if ever do we hear of a football coach having a winning team who has never played the game himself. Review the success of the late Knute Rockne. His teams carried on under his enthusiasm and drive. He lived that which he preached.

We in the utility industry can well pattern ourselves along this line. The folks on your team will not be any more enthusiastic about a program than you exemplify in your daily work. If you want good employee relations you must be a real, live part of your team. Regardless of whether you have one hundred people in your organization or one thousand, the same plan must be followed, and likewise every member of the staff must reveal this pep and enthusiasm.

It has been my observation that although we in the industry have performed a splendid job from an engineering standpoint, we can certainly take a few lessons from some of the large industries in the country who have achieved success through highly trained sales organizations. Certain leading manufacturers in this country actually spend several thousands of dollars on a new employee before he is given his job. They find this training indispensable. It is unfortunate that we have not given more thought to this particular angle in the utility industry. Generally speaking, I find that where a new man is hired it is taken for granted that he will

eventually learn how to read a meter and become informed on the company's policies.

Recently on one of our properties we prepared a booklet on company policies. We have sent this booklet to quite a number of utilities who have been interested in the experiment. The interesting angle is that the employees of the company were responsible for the company policies.

We feel that for many years the company has been establishing its policies on what it feels the customer will want, whereas the answer is to find out from the customer what he expects and what he wants from the company.

During the past eighteen months we have set up a visiting program on some of our properties and have called upon approximately ten thousand customers. This visiting program has not been the house-to-house canvass type, but the service man, the meter reader, and in some instances the cashier, have all taken time out to go into the home, preferably of an evening, to visit those customers whom they know and to discuss the service, the rates, and the company's policies in the particular community in which they live. Then the customer is asked what he would suggest for the betterment of the service and what he would further suggest might be done with regard to the company's policies. This program has been most successful.

I appreciate that a program of this kind is not as simple as it sounds for the large metropolitan area. However, the fact remains that there are not a great many large metropolitan areas, whereas there are thousands of the smaller communities with populations of fifty thousand and under. We feel that these smaller communities make up the real problem of the utility companies because they are more vulnerable to attack and of course the large operating companies have many of these smaller communities on their systems. I feel that the program which I am discussing is not precluded from any operating company.

We are well sold on this type of visiting program in various parts of the country. In other words, we are going to the customer's home, discussing our problems, and asking for his guidance, rather than waiting for him to come into our office and then getting his suggestions. Naturally the success of such a program is dependent upon the personnel of the company being sold on the idea. And again this comes right back on the plate of the management of the local office—how enthusiastic is your leadership? You can do any of these things to which you set your mind providing you are just folks and have the pep and enthusiasm to lead the program.

It has been our experience that public relations will come along in a most desirable fashion where the employee relations are everything one could ask for. And again this requires considerable planning so that you can develop a happy family spirit. We have tried not only to have a complete understanding with the personnel of the organization but also with the families of the organization. I have found it very desirable to talk with the families of the employees. They have quite a number of contacts in the various communities in which they live. I am anxious for them to know the problems of the company. This develops a better understanding and the home of the employee is in complete accord on the policies of the company.

Naturally the development of this understanding must not be superficial on the part of the management. Should it develop that you are not sincere and do not actually live the things which you present to your organization the program had best be forgotten because it will do more harm than good.

We have carried on quite a number of experiments in small communities in various parts of the country, and where a sincere and honest effort has been followed it is interesting to note that in every instance the company has overcome its difficulties and has taken the place in the community where it rightfully belongs.

I have made it a point during the past couple of years to go into a few communities which have during the past ten years gone into municipal ownership. In taking time out to discuss why the community took over the light plant, it is interesting to analyze some of the reasons given by a cross-section of the businessmen. I found one man, a leader in his community, who was a friend of the light company until he was turned down on a donation for some type of civic improvement. He stated that he knew the light company was making money and that there was no reason why the local manager should not participate to the same extent as his business participated. The light company lost a friend, and approximately three years later that company had lost its business and the town is now under municipal ownership.

It is true that this is only one sidelight in this particular case and I shall not take time to go into quite a number of reasons that were given me in some of the communities. The fact remains that had the local manager a complete understanding of the policies which the company should have had in effect, more than likely they would have retained the friendship of an influential citizen.

In my humble opinion, we give too much emphasis to the big things and do not consider sufficiently the little things. The big things are expected of the light company in the communities in which it operates. However it is the little things, such as shouldering more than its share of every single activity that goes on in the community, which have a great bearing on the standing of the company in the community. This cannot be done in a stereotyped manner, but the local manager and the personnel of the organization must be sincere and honest in their dealings with the community, and want to become part and parcel of every activity that contributes to the betterment of their home town. The question for us to ask ourselves is, "Am I carrying on and do I honestly believe in this policy." If not we should, in all fairness, get out of the industry regardless of what position we may hold.

Some months ago I was talking to a group of employees and their families on this very subject, pleading for a better understanding of our problem, asking for their assistance in treating our customers in the same manner as they would like to be treated if the conditions were reversed. After the meeting a lady came up to me and made the comment that what I had outlined was more or less the Golden Rule, that everybody knew about it, but unfortunately very few people did anything about it. She was correct in her statement. What I have been preaching to the folks that have been associated with me for the past number of years is the Golden Rule, and I suppose that I shall always preach the same gospel.

May I remind you that there have been churches in the world for the past nineteen hundred years and I notice that they are still open each Sunday, that the ministers still preach the same gospel. Insofar as I am concerned, the success of our industry is just like that. We shall have to continue preaching courtesy, kindness, and a complete understanding of our problem, and we shall have to

continue to do it so long as we hope to stay in business.

During a recent visit with an executive of a certain utility company I was invited to go over a most complete public relations program. The set-up was very good and the company had gone to considerable expense in the preparation of booklets, charts, and other detail. It was the opinion of the management that the public relations job was finished. They had set up an elaborate vehicle and they could now sit back and watch it operate. It has been our experience that this is not the way to get the job done. We find that after a particular district has apparently caught the vision of a customers' relations program that it must be watched very carefully and receive continued treatment. Its growth is similar to that of the century plant, and it actually takes years to get over the sincerity of the company's policies because you are selling the intangible.

Regardless of how complete or elaborate we set up a public relations program the fact remains that the management and the staff must be the prime movers; in other words, the example set by the official family and the department heads will make or break the program. The right kind of leadership will cause the personnel actually to want to be part of the program. You just cannot be a hypocrite to your organization.

We occasionally run across an individual in our company who does not subscribe to the kindness and courtesy which we attempt to have manifested throughout every department in the organization. When a situation of this kind comes up we ask the individual to take a week or so off at our expense and to secure another job. We feel it very desirable to terminate properly the services of an individual, to the same degree we take in his employment. This is an important point in our management.

Space does not permit me to go into the various experiments which we have tried in this section of the country, but I am about convinced that some of them may possibly be along the right line.

As an example, in a community where we had finished visiting with every customer and had tried to pattern the policies of the company along the lines passed on to us by our customers, we sent out 4,500 questionnaires asking the customer what he thought of what we were trying to do. It was interesting to me to find that we received a 12 per cent return from the questionnaire with only three replies having any criticism of the company.

What I have stated here is not theory; it does not come from long range management, because I occasionally attempt to spot-check these various programs so that I shall not be dependent upon somebody else's story with regard to the results.

I think that it is about time for those of us who feel that we were more or less born into the business to dedicate the balance of our lives to one of the finest industries this country has ever known. Someone must carry on. We have as fine a group of people in this industry as any other group in the country. Let's all be just a little more human. I think you will find more enjoyment in your job regardless of what capacity you may be serving if you visit with the folks who make your job possible, and I mean your fellow employees. They, in turn, will appreciate an opportunity to take part in such a program which lends security to their company and their job. You will find them eager to participate in a visiting program among their customers, which is most necessary for the success of the company's policies. I am a great believer in visiting and certainly feel that the person who wrote the song "The More We Get Together, the Happier We'll Be" knew what he was talking about.

Power and National Defense

"Because its relations with the electric power industry offer perhaps the best single key to the government's attitude toward private industry as a whole, two points made by President Kellogg in his address at the annual convention of the Edison Electric Institute are noteworthy. Mr. Kellogg began by admonishing the assembled executives of electric utility companies that the 'salvation' of their industry was largely in their own hands. Though he by no means overlooked the bearing of governmental actions and policies on the future of utility investments, it is reassuring that this leading exponent of free enterprise also recognized its own share of responsibility for its fate.

"The other particularly interesting feature of Mr. Kellogg's remark was his treatment of the question of aggregate generating capacity in relation to possible war-time demands. It is a matter of common knowledge that efforts have recently been made, in official and semi-official quarters, to create the impression that our present installed generating capacity is woefully inadequate to the national defense. By implication if not expressly, that asserted inadequacy is offered as argument for the creation of more government-owned hydro-electric plants.

"Against an increase of 25 per cent in population since 1917, Mr. Kellogg said, the private electric industry is capable of producing nearly 400 per cent more power. A considerable part of the present production, moreover, is used in connection with activities which in time of war would undoubtedly be classed as 'luxuries' and would therefore be curtailed or suppressed to divert fuel, materials and labor to more essential war-time purposes. He regarded it as more likely that war-time conditions would mean a surplus than a shortage of electric power.

"This is an expression of opinion, to be sure, but it is the opinion of a man of engineering and executive experience. And it is strongly buttressed by the testimony of another utility industry engineer, General Charles Keller, before the same convention. General Keller indicated some of the difficulties in attempting to determine in advance where the war-made demands for additional power are to occur; he also told why such additional demand must necessarily develop comparatively slowly as the nation's war effort progresses from one stage to another, concluding that the national defense would be best served by completion of detailed plans for generating units of agreed size which could readily be provided when the locus of need had been determined.

"Undeniably, the national defense is important, but it is also important that it be served without rushing the construction of 'needless or badly located plants,' to use General Keller's phrase. We have seen only too clearly that, in peace time at least, government-owned power forces private enterprise out of the field to provide itself a market."—*Editorial, Wall Street Journal, June 8.*

A DAY'S MUSCLE WORK EXPRESSED IN ELECTRICAL TERMS

A DAY OF HARD LABOR, USING MUSCLES FOR POWER IS ALWAYS LESS WORK THAN ONE KILOWATT-HOUR

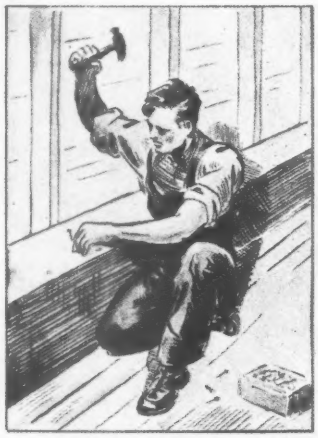
Pumping (or sawing) a man can do 1,188,000 foot-pounds of useful work in 10 hours.

The day's work = about ½ of 1 kw-hr. The man's power averaged 45 watts, or = to small kitchen fan.

Lifting 65 tons up 4 feet = 522,700 foot-pounds in 6 hours.

The day's work = about 1/5 of 1 kw-hr. The man's power averaged 33 watts, or = to a heating pad on "low".

Hammering all day a man can do 480,000 foot-pounds of work in 8 hours.



The day's work = about 1/6 of 1 kw-hr. The man's power averaged 23 watts.

Lifting 16.7 tons up 12 ft in a hod = 401,760 foot-pounds of useful work in 6 hours.

The day's work = about 1/7 of 1 kw-hr. The man's power averaged only 25 watts, or = to a small lamp.

Wheeling 51 tons up 3 feet = 309,600 foot-pounds of useful work in 10 hours.

The day's work = about 1/8 of 1 kw-hr. The man's power averaged only 12 watts.

Shoveling 25 tons of loose dirt up to shoulder height = 280,800 foot-pounds in 10 hours.

The day's work = about 1/9 of 1 kw-hr. The man's power averaged only 11 watts.

Data re: Foot-pounds and Hours of Work from Kent's M.E. Handbook 1916.
Translated into electrical terms by C.M. Ripley, General Electric Company
One kw-hr. = 2,655,200 foot-pounds-of work (From top of page 43, G.E. Diary, 1939)

If the thought is reversed, the facts seem even more incredible—

One kilowatt hour is equal to the muscle work of a man pumping for two days, lifting weights for about five days, hammering for about six days, carrying a hod for about seven days, wheeling bricks for about eight days, or shoveling for about nine days.

A Kilowatthour

When You Buy Electricity You Buy WORK

By C. M. Ripley
General Electric Company, Schenectady, N. Y.

An Address Before the Second General Session of the Seventh Annual Convention of the Edison Electric Institute, New York, N. Y., June 7, 1939

TO me the most helpful, thought-provoking idea ever written about electricity appeared in *Popular Mechanics* Magazine in an article called "The Home That Runs Itself," written by H. W. Magee of its staff. The sentence was:

"When you buy electricity you buy work."

To me this idea was as startling as a flash of lightning on a dark night. For 40 years I was sure nobody knew what electricity was. And Dr. Steinmetz said he didn't know. And Dr. Whitney, founder of our research laboratory said he didn't know. And then up pops *Popular Mechanics* and says it's WORK!

I asked a consulting engineer if that really wasn't a new definition of electricity. He replied: "It is a true and original statement, that should prove helpful, but it is not a philosophical definition."

But IS electricity work? Let's apply the High School rule, that two things equal to the same thing must equal each other.

We know that Work can be expressed in foot-pounds.

Then if electricity can also be expressed in foot-pounds, we are sure that Electricity IS work. So our search simmers down to answering this simple question:

"Can (a *unit* of electricity) 1 kwhr be expressed in foot-pounds?" Here's the quickest answer. On page 43 of the familiar little G-E diary appears a little known fact about electricity:—ONE KILOWATTHOUR EQUALS 2,655,200 foot-pounds—(of Work). So, ELECTRICITY *IS* WORK. That sentence to me was a stroke of genius.* For he interpreted electricity in a new way in just seven words—and six of them were monosyllables!

MR. RIPLEY

That sentence clears away much of the mystery. To me it established a new advanced outpost of electrical thought. It extended the frontier of knowledge about that invisible thing called electricity. The area of darkness and mystery and "mental fog" is much lessened. Now we can explain to the kiddies that "the WORK IS DONE in the power house down by the river: and is USED all over the house. So we buy Work by Wire!"

All that remains to be done now, is for the Philosophers to tell us how the work gets through the wire! Amiel wrote: "The Philosophers aspire to explain away all the mysteries."

Different Kinds of Work

One kind of work is to climb stairs. Last March I tried to climb the Washington Monument, but soon found the WORK too much for me, and turned back and took the elevator. Later confessing my failure to a friend he said: "You were right. It's a terrible, colossal undertaking. I've done it twelve times." I asked him why *twelve* times—why wasn't once enough. And here's his strange story:

"I had to. I worked for a U. S. Senator in Washington. Part of my job was to show his visitors about the city. And you'd be surprised how many wanted to hoof it all the way to the top of that monument. I was their host. I had to go with them! And poor me—I weigh 200 pounds. My heart thumped badly before half way up. Frequently I had to beg for a rest. They just ran me ragged. It's so terrific an undertaking—that it amounts to an athletic feat." And he did not smile when he said it.

So we figured out how much work it really was. To raise the average man's 150 pounds up the 500-ft. climb of the monument takes 75,000 foot-pounds of work. That looks big. But as hard a job as it is, the work in the climb is less than 3 per cent of the work in one kwhr. So, the man would have to climb it thirty-five times before his work equaled the work in one kwhr—bought by the average housewife for about four cents.

I wouldn't climb it thirty-five times for one hundred *dollars*. Yet the U. S. Department of the Interior tells me that 1 kwhr will take to the top 40 people averaging 150 pounds each.** This costs Uncle Sam less than two cents. No wonder the ride is free. So POINT NO. 1 is: *One kilowatthour is work—equalling 35 trips up the Washington monument.*

POINT NO. 2 is: *No man can make a kilowatthour in a day with his muscles alone.*

To learn the value of anything, just try to make one yourself. Two years ago we built a stationary bicycle that drives an electric generator. Anyone who pedals the bicycle-driven generator,

* Henri Amiel in 1870 wrote: "Doing easily what is difficult for others, requires talent; Doing what is impossible for talent, requires genius." And Ralph Waldo Emerson wrote: "Next in importance to originating a good sentence, is to give it publicity."

** The counterweight helps lift.

soons gains a very, *very, wholesome* respect for the work in one kilowatt-hour. I rode it hard for one minute and was breathless. The electricity I made was worth 1/40 of a cent, or the price of one safety match; that's what I'm worth as a power plant. But I'm only a novice.

At Madison Square Garden a champion six-day bike racer pedaled this same machine in a desperate sprint of one minute. The meter showed he made 0.0018 killowatt-hour. If he and his team-mate had kept up this sprint for six days and six nights (impossible, of course) they would together have made 78c. worth of electricity, poor pay for a week's work for two famous athletes. It wouldn't even pay for their coffee!

And at the Better Homes Show in Billings, Montana, 213 people rode this machine until they were tired, and their combined work was 2½ kwhr, worth 10c.

In Schenectady we set up an efficient hand-driven generator that made 60 watts. Few men turned it more than a minute. A strong young porter, formerly a pugilist, accepted my offer of $12.00 an hour as long as he could keep the 60 watts of lamps burning. He quit, exhausted in just 13 minutes. When I asked him why he quit, and reminded him his wages were $96.00 a day, he gasped "The money wasn't—worth the work." He was fagged out in the making of 1.3 per cent of one killowatthour. It would take at least two men grinding eight hours a day for three weeks to make one unit of electricity that way; and at $5 a day wages for each, the cost would be $100.

POINT NO. 3—*One kilowatthour is always more work than any man can do in a day.*

This is true no matter how strong or ambitious the man, and no matter what the task, and no matter what the wages, inducement, honors or bonus. Engineers have measured in foot pounds, the work that all kinds of laborers can do in one day. They have done it in the U. S., England, Scotland, France, Egypt and China. These jobs included lifting weights by hand, by hod, by wheelbarrow, by rope and by pulley; also turning cranks, shoveling, towing canal boats, hammering and pumping, sawing, rowing and pushing on a capstan.

The engineer's reports I have seen are unanimous in one respect: Regardless of race and climate, in Orient or Occident, in this century or the last—

MAN'S MUSCLE WORK AND POWER IS PUNY, NO MATTER WHAT THE TASK.
Electricity infinitely more powerful and also much cheaper than muscle power

	Hours He Can Keep It Up	Tiny Work Done in One Day By One Man In Ft.-Lbs.	In Kwhr	Average Power Exerted in Watts
1. Shoveling 25 tons of loose dirt up 5 ft. 3 in.	10	280,800	.11	11
2. Pushing wheelbarrow up 1/12 incline and returning unloaded (51 tons up 3 ft.)	10	309,600	.12	12
3. Carrying the hod upstairs and returning unloaded (16.7 tons up 12 ft.)	6	401,760	.15	25
4. Hammering	8	480,000	.17	21
5. Lifting weights by hand (65 tons up 4 ft.)	6	522,720	.2	33
6. Lifting with rope and pulley and lowering rope (21.5 tons up 15 ft.)	6	648,000	.24	40
7. Pumping (or sawing) 11,200 gals. up 10 ft.	10	1,188,000	.45	45
8. Turning crank or winch (25 tons up 25 ft.)	8	1,267,200	.48	60
9. Pulling or pushing horizontally as on oar	8	1,520,640	.57	72

Above adapted from p. 532 in Kent's Mechanical Engr's. Pocket Book, 1916.
The average of the figures from Kent show that a man can do 0.28 of a killowatt hour in a day's work, and that his power averages about 35 watts.

The following measurements were made (mostly in China) by Prof. P. I. Wold of Union College, Schenectady, N. Y.

			Hours Per Man	Ft. Pounds Per Man	Kwhr Per Man	Watts Per Man
2 men lifting water up 5 ft. in a swinging basket, raised 116 tons or 27,800 gals.	17.6 lbs.	22 baskets per min.	10	580,000	.44	22
1 man lifting water up 5 ft. 5 in. with a well sweep (raised 104 tons or 24,900 gals.)	36.2 lbs.	8 buckets per min.	12	1,130,000	.42	35
2 men, taking turns at tiller and tow rope, pulled canal boat 17 miles in 10 hrs.	23.6 lbs.	150 ft. per min.	5	1,062,000	.40	80
1 man with hod carrying bricks up 6 ft. and stacking them (12 tons up 6 ft.)	200 lbs.	A load every 3 min.	10	240,000	.09	9
1 man (in the U. S.) with hod carrying bricks up a ladder 17 ft. (6 tons)	68 lbs.	22 loads per hour	8	203,458	.08	10

The average of Prof. Wold's measurements show that a man can do 0.28 kwhr. in a day's work and average 31 watts of power.

not one engineer ever found any man, either laborer or athlete, that did the equal of 1 kwhr or 2,655,200 foot-pounds of work in a day; and some worked ten and even twelve hours per day as in China and Egypt.

Their day's muscle work averaged only 28 per cent of 1 kwhr.

So people waste money if they have jobs done by muscle power for any length of time. Dr. Steinmetz said: "The Electric Way is Always the Cheapest Way." This is even more true in the home than in industry.

POINT NO. 4—*The average power which a man can exert all day is 35 watts.*

This information was gained by changing the foot-pounds in the measured day's work into watt hours and dividing by the hours worked. The fact that they average only 35 exposes the widespread fallacious belief that a workman can average 1/10 of a horsepower and keep it up all day. He can't do half that at the average task. What they *were* able to maintain varied from nine watts in one of the hod carrying jobs up to seventy-two watts rowing, and pushing on a capstan.

Since laborers can only do from ½ to 1/10 what most people think, that convinces me that electricity is two to ten times cheaper than most people think.

But, partly because electricity is invisible, millions do not appreciate how much they get for so little money. For instance:—

POINT NO. 5—*For the cost of one cigarette a family can obtain perfect refrigeration for five hours in a good machine.*

I think it was McGuffey's Reader

that asked "What happens when an irresistible force meets an immovable object?" That question has not been answered. But in a more modern vein, "What happens when an incredibly large amount of work can be bought for an unbelievably low price?" The answer is "miracles—even greater miracles in the home than in industry." One of the charts shows the miracle it did in my home—permit the saving of $500 yearly in ice, food, fuel, and help; and at the same time the electrical work we bought abolished all the dreaded drudgeries of housekeeping. Many people think I exaggerate. Perhaps what they do not understand is that a kilowatthour is an incredibly large amount of work. And

POINT NO. 6—*$10 buys from 24 to 38 times as much electricity as $1 buys.*

In Schenectady for $10 we get 417 kilowatthours. Believe it or not, this is an amount of work equal to more than 1,100,000,000 foot-pounds done each average month in my home. This work equals the toil of 50 laborers eight hours a day for 30 days, all for $10. Used in a good elevator, it would take 28,000 people up 500 feet and back down again. Marching four abreast they would form a parade 13 miles long.

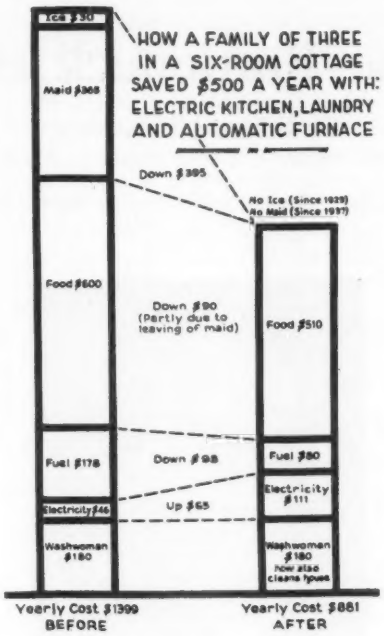
And yet all that work is enjoyed for $10 by my family of three in a six-room cottage. No wonder people in all-electric homes are enthusiastic. It is because they get the electrical bargains, an incredibly large amount of work, at an unbelievably low price. As my wife puts it—we get $24 worth for $10.

And also they live better because they have abolished all the dreaded duties of housekeeping; and that leads to

POINT NO. 7—*It costs less to live better.*

That is the paradox of modern housekeeping with good engineering. And it breeds customer good-will. I am told that most of the kickers about the cost of electricity pay from $1 to $4 a month. So the kickers are those that miss the big bargains in electrical WORK. All-electric homes build load, and build revenue, and build good-will. People like the bargain of $24 worth of electricity for $10 in Schenectady, or $38 worth for $10 as in Palm Beach, Florida or Plattsburgh, N. Y. Do you know of anything like it in the whole merchandising world. How it dwarfs six for a quarter and three for a dime!

But any sales or promotion policy which does not encourage *complete* home



electrification endangers good and invites poor public relations. Because the customers don't use enough electricity to get it cheap. So they miss the electrical bargains. The way to get them out of the kicker class is to help them get a complete electric kitchen, laundry and automatic furnace. Then they will be happy and that should assure good public relations. Why?

POINT NO. 8—*For in such a family, the dreaded drudgery is shifted from the home, where it was a burden, to the power house where it belongs.*

And, in addition, they save money, because it *does* cost less to live better. And boosting appliance sales boosts factory payrolls. More skilled labor is needed to build a cleaner than a broom, more to build a refrigerator than an ice box, more to build an electric fan than a paper fan.

Moreover, from 20 to 100 more different materials are needed to build modern appliances than the old utensils. To build a half million refrigerators requires the purchase of over $15,000,000 worth of materials, of almost unbelievable variety. Thus, all back along the line to the bosom of Nature, still more employment is made in mines and mills and factories and fields and forest and farms.

So surely, to the housewife and the farmwife, to industry and transportation—this magic business we are in is an unmixed blessing—to all concerned.

This talk was an attempt to analyze your product and to reveal facts about it which you might use. For two years I have been given carte blanche to carry on this kilowatthour research. Some of my findings are on the bulletin board. Look at them when you have time. They are not copyrighted. We offer them to you for any use you see fit. Perhaps you may desire to get them into the hands of your advertising and sales managers who might find them useful in promotional campaigns, to build load and revenue, and win more and more good boosters, in more and more all-electric homes.

Yours is a wonderful story. We welcome any opportunity to help you tell it again and again, in better and better ways, to the millions who do not know the bargains they are missing.

What an opportunity—yes, privilege is yours to tell 30 million housewives how electricity can drive out the dirty, dreaded drudgery from their homes, preserve their health, youth and beauty, and also save money doing it.

Perhaps by next year you will have received the blessings of a million rejuvenated housewives, important citizens — transformed into enthusiastic boosters for your business. It is not beyond imagination, that their enthusiasm may be more valuable to you than the added revenue.

Build load, and you also build the goodwill that comes from full use.

For the all-electric home is not the white elephant, but the white hope of the electrical industry.

Balanced Load Building

(*Continued from page* 313)

rearrangement of his load in such a manner as to improve the relationship of that load to the system load cycle. While a recognition of this fact is essential with large electricity users, it can by no means be ignored even in dealing with the smallest customer. If rates offer a reward, as they should, to a customer for operation which produces this result, then it is often possible to work with the customer to even reduce his bills and yet make him a more profitable component of the utility load.

The price of balanced load building is certainly unremitting and highly intelligent effort. Order-taking will not do. Neither will the blind selling in volume, no matter how big, of this or that device or appliance or method of using electricity.

(*Continued on page* 332)

Wiring—the Bottleneck of Lighting

By Edward T. Gushee
Vice-President, Detroit Edison Company

An address before The Illuminating Engineering Society, Michigan Section, Detroit, Michigan.

THE subject of this talk is "Wiring—The Bottleneck of Lighting." The title would have been more apt if we had called it, "Wiring Restrictions—The Bottleneck of Dollars for Manufacturer, Jobber, Contractor, Labor, Utilities, and the Public."

For years I have had something to do with buying for The Detroit Edison Company. In the exercise of that function, I have encountered a number of "bottlenecks." One of the most interesting of these bottleneck problems was the electric range, the sale of which ten years ago was stymied by four factors: (1) first cost, (2) bad operating characteristics, (3) installation costs, and (4) rates. I refer to the electric range because it is an all-inclusive picture. Through a number of developments, ranges are selling today for roughly 50 per cent of the price prevailing in the 20's; operating efficiencies in speed and consumption have been bettered by some one to three hundred per cent; the national rate schedule in general is very competitive with other forms of fuel; and the installation cost has been reduced better than 50 per cent. Every part of this great industry has made its contribution. When I use the word "industry," I am not referring to public utilities, but rather to the electrical industry as a whole—the manufacturer, the jobber, labor, inspectors, technical societies—in fact, the whole general, associated, electrical industries.

Let me tell you of my own experience in connection with the installation of electric ranges. In 1928 I installed my first electric range. I lived in a two-family house. The installation of that range cost me $110.00. A year later I moved to another house. The installation cost of the range at that location was something of the order of $60.00, which, by the way, was roughly the average cost of range installation at that time. Two years later, I moved again, and the new installation cost was then around $35.00. Now the present cost in this territory is approximately $25.00.

Today there are 70,000 ranges on Detroit Edison lines. Sales of ranges last year were approximately 10,000. A large number of ranges are also being sold in many other parts of the country. Now, mind you, I don't say that any *one* of the factors which I have mentioned is solely responsible for the vastly increased number of labor hours and the increase in profit possibilities to every part of our industry, but the increased sale and use of this product have very definitely been due to the fact that all of these costs have been brought down within reach of an ever-increasing number of people. All will agree, as a matter of theory, that more people can buy a range for $100.00 installed than they can a range for $200.00 installed. Yet a great many people think it is possible to sell anything at any price provided you spend millions of dollars in advertising and hire a group of salesmen to canvass the market. That may be true as an introductory step, but the big market is the man of average income—the man who earns from $1,200 to $2,400 a year. This man, after he has paid for the bare necessities of his family, hasn't many dollars left to buy a lot of other things. So we all must recognize the fact that the way to get him to avail himself of the comforts he wants is to make the cost of those comforts within reach of his pocketbook—and incidentally such a course will also increase the dollars he earns.

MR. GUSHEE

I have said that all will agree to this as a matter of *theory*. Let me emphasize that while I have used the word "theory," it isn't a theory—it's a fact. To put it in another and broader way, the national standard of living, i. e., the material comfort of all the people, can be increased only by passing on as rapidly as possible the efficiencies of technological and scientific improvements and developments; and may I emphasize that the individual well-being of all of us is directly tied up, politically and economically, with the increase in the standard of living of *all* the people.

It isn't a redistribution of wealth that this country needs—the natural law of the survival of the fittest, the tax laws, and the general economic situation will take care of that all right, by and large. What we do need is a real understanding between the three parts of our economy—labor, farmer, industry—that the only way to increase our individual standard of living is to work together so that we do not block the economy by withholding developments, by lack of production, by special privilege, or by whatever means—but that by passing on the benefits of these things to the whole nation, we increase their standard of living and thereby save for ourselves, not only political and religious liberty, but economic independence.

It doesn't make any particular difference whether we think that this sort of a program is equitable or moral or not. Personally, I do. Human beings by nature are selfish and, as I have said elsewhere, whether or not this course of economic action is right and just, from a realistic approach and from a selfish approach, it is the only course in our own individual self-interest. We must ourselves get economic understanding. We must try to reach other people with the understanding that our economic life must be one for all and all for one—

else we face political and economic oblivion.

Now what does all this have to do with wiring, wiring codes, and our practical, everyday problems? I think it all hinges about the word "understanding"; or, I am afraid, in this particular instance, perhaps I had better say "misunderstanding." Let me reminisce for a moment. About three years ago Mr. Dow asked me to interest myself in the wiring and Code questions. I knew literally nothing about the subject except for some small experience in connection with electric ranges and electric range installations. I had very apt tutelage, however, from those in our company who were informed. Of course, I found immediately that the subject was very complex in its technical aspects, that there were a large number of different interests involved, and that everyone who was in any way, shape, or form connected with the electrical business had an interest, and, if I may use a very mild expression, had vehement opinions about the entire matter. After I had digested some of the mass of accumulated written data, I made up my mind that the most important thing to do was to visit with representatives of these different groups and find out how they felt about it. This I did. I talked with other utility men; manufacturers—many of them; inspectors; insurance interests. I talked with jobbers and I talked with representatives of labor. Two things I found in common among all groups: (1) a lively interest in the subject, and (2) that each called all the others bad names. There was a complete lack of understanding sometimes even within a given group and certainly between groups. Yet, the more I studied the problem, the more it seemed to me that the interests of every group concerned were identical, and that the interests of every part of our industry tied in directly with the paramount interest of the public. I also found that the wiring problem tied in directly with those things which I have heretofore said in connection with the whole economic problem—in other words, that if we, as an industry, would increase the standard of living of the general public in relation to the greater use and availability of electricity, we would thereby, in each and every group, profit ourselves.

The major problem was not the technical questions. They were the least of the worries—despite the fact that for years representatives of all factions had been engaged in vitriolic name-calling. The major problem was one of understanding—a problem of education, if you will—of understanding that all parts of the industry, as well as the public, would be better served if, with safety as a first consideration, ways and means could be found to make this increased standard of living available to larger and larger numbers of our people. There were many individuals in all these fields of endeavor who saw the problem in a similar way.

As a preliminary step, a group of executives of the power companies and the manufacturers met three years ago next October. I shall never forget that first meeting. There was as yet no basis of understanding within the individual groups or between the groups. As a result, there was an inordinate amount of table thumping, high blood pressure, and harsh words. I like to compare that meeting with the one held in New York in February, with much the same group. There was no tension at this latter meeting. Things were talked out in a frank, friendly way. We had both found that neither of us was equipped with horns and tail. We had both found that each had his own particular problems, and that, as is true in practically all human affairs, the out was an understanding of those problems and then a logical compromise.

To a greater or lesser degree, I can say that the same increase of mutual understanding has developed among all the groups. Now I do not mean to say that the millennium has been reached—far from it. Much still remains to be done. But there is a distinct hope that all parts of this great industry of ours will sooner or later arrive at that understanding—an understanding of the mutuality of our interests with those of the public. As a matter of fact, it was over a year before we of the utilities, for instance, realized the lack of understanding among our own group and almost two years before we did anything about it.

I have already referred to the technical aspects of these questions. I am more or less ignorant of the technicalities involved, and I have purposely kept myself ignorant of them. With safety to life and property always before them, the engineers and scientists of our industry have found some solutions and will find others.

To get down to cases, what are we actually concerned with? Broadly and without detailed technical discussion, the problem that faces us all in relation to wiring is the making available to new and old houses, and buildings of every sort, more capacity at less unit cost with equal or greater safety. A step in that direction is embodied in the Edison Electric Institute's so-called Seven Points, which have been variously nominated "The Eight Points," "The Nine Points," and "The Twenty Points"—again an illustration of misunderstanding and confusion. These items have been suggested by the Edison Electric Institute through Mr. Kellogg, President, as amendments to the Code which would permit, in some measure, attainment of the goal I have expressed.

Now there are a large number of different groups represented here and perhaps the best way to approach the practical aspects of this problem would be to indicate how you and your particular group would profit through and by an adequate wiring program.

I am an employee of a utility company and I am sold on this program. So is my company and so are an ever-increasing number of utilities. Naturally, working for a utility, it was the utility dollars with which I was at first primarily concerned. It is unnecessary to detail the specific reasons why we in the utilities feel that we would be benefited by better wiring, but may I call to your attention one or two aspects of the question which may not have occurred to you?

We receive many complaints from customers who can't satisfactorily use their appliances and electrical equipment. Many of you may not realize that The Detroit Edison Company maintains a crew of 206 troublemen who investigate blown fuses. Last year they made 306,000 calls on customers' premises, and a large percentage of these calls were interruptions in service due to undersized copper capacity.

Moreover, there is constant pressure to lower the cost of the product which we sell, and the only way that can be done is to increase the sale—to get people to use more of it. Here we have been smack up against a merchandising situation which has been impeded because of the first cost involved in changing the wiring.

Illuminating Engineering Society

Next let us see how the question applies to the members of the Illuminating Engineering Society. Your first interest is in the increase of the levels of illumination—getting people to use better

fixtures and better quality lighting. Speaking of better lighting, I wonder how many of you yourselves have really adequate, up-to-date lighting in your own homes.

We would all think it rather peculiar if we saw an executive of an automobile company driving around in a 1920 automobile. We would likewise think it peculiar if an electric washing machine salesman permitted his wife to bend over the old scrub board. When I realized this, I started a real analysis of the rewiring and relighting of my house. You may be interested to know that despite the fact that I shall have very little "trick" lighting—I'll have a spot of color here and there, adequate switching and adequate levels of illumination —nevertheless, relighting my house properly will cost between $750.00 and $1,000.00, including redecorating. Perhaps I shouldn't mention this cost, because it isn't a very good recommendation for rewiring and good lighting. However, it is part and parcel of our whole problem and the problem of the Illuminating Engineering Society.

We all know of many office buildings and many houses where rewiring costs are standing in the way of more satisfactory illumination. Later in this paper, I shall give some illustrations when I am discussing the problems of other groups in our industry. I want you to realize that while these are used to illustrate the contractor picture, the manufacturer picture, or others, they also affect all parts of our industry.

There is no question that the work of the members of the Illuminating Engineering Society would be more profitable if costs were such that more adequate wiring was available. Right here I wish to mention something about costs. I do not propose to discuss actual job costs for the very obvious reason that such a discussion must go into considerable technical detail; and without that carefully worked out detail, there is plenty of opportunity for misunderstanding. There is an opinion prevalent in some quarters that the possible reduction in cost is so small that it isn't worth while. This opinion can be successfully controverted, but only by a detailed analysis for which this is neither the time nor the place.

One more word about cost—When we who are interested in the wiring problem refer to cost, it naturally divides itself in our minds into two parts: (1) An actual reduction of cost for the rewiring of old buildings, whether office buildings or houses. (Present costs do not get the work). (2) The reduction of unit costs *only* for wiring of new projects, but coupled with active sales promotion for more units. Together these will produce vastly greater gross business for all.

It may be thought that fluorescent lighting is going to solve this problem of wiring because it requires less wattage. However, there are very definite problems both of cost and installation in connection with fluorescent lighting. That it will in the immediate future replace any large amount of incandescent lighting is very much open to question. A great many people with whom I have visited feel that fluorescent lighting will be plus lighting. Without question, as far as we can now see, this development does not solve the wiring problem. All of this goes to show that less sales resistance will be found industrially, commercially, and in residences, when the wiring and related problems are solved. Certainly it is to the self-interest of illuminating engineers to forward this program.

Manufacturers

We next come to a consideration of the effect of the wiring program on the manufacturer. Electrical manufacturers will benefit in many ways, though there be changes in materials which tend to reduce unit costs. It is even possible that some new materials will sell at a price higher than materials which they replace. Moreover, as far as I know, no one is advocating a departure from broad national standards. Such a course would defeat the primary objective, that is, a decrease in final cost, or, to put it positively, an increase in ultimate value to the public. Nor is anyone losing sight of the importance to the consumer, as well as to the investor, of a proper regard for obsolescence of present tools and machinery. However, all these things can be given due consideration without holding back developments for 15 to 20 years.

After all, some manufacturing deficits —even price structures—might be much bettered if the volume which this program presupposes can be obtained. Nor should we forget that the electrical wiring end of this business is only one part. Actually, electrical manufacturing may be divided into three sections. Wiring is a very small part of the total picture. It is, however, truly the bottleneck through which we provide means to use millions upon millions of dollars' worth of appliances, for which in turn must be invested other millions and millions of dollars in generators, transformers, turbines, and all manner of electrical materials. At the end of this chain is the present and entirely too small market for wiring materials. It is not necessary to point out that unless sufficient wiring can be sold, the connecting link between generation and utilization equipment is not provided. It has been stated—and I think with justification—that unless we revise and simplify installation procedure to the point where the general public can afford to pay for it, the present annual sales of appliances and generation and distributive equipment will be materially reduced. On the other hand, if the ultimate consumer can afford proper wiring, he will be able to use additional appliances and the utility companies will consequently find it necessary to add to their capacity.

This will indicate the vast possibilities, the very real dollar interest, which manufacturers have in this subject. As this whole broad program is developed, it is impossible to conceive how any single manufacturer will suffer, even though changes in shapes, sizes, or patterns of various material may be found necessary.

Jobbers

Jobbers will profit for the same reasons that manufacturers will profit. After all, the jobbing business is largely dependent upon volume. When more materials are sold for house wiring, when old commercial or office buildings and factories are rewired, the jobbers will stand directly in the path of that business. If the customer can afford to have such work done, the jobber, though he may sell a given item for somewhat less than that item sold for before, will sell more jobs and consequently will reap his increased profit.

Contractors

Next in the chain of utilization we come to electrical contractors. What has been said about manufacturers and jobbers is equally true of the contractors. Here we have very concrete illustrations of what actually happens. As a result of cooperation with The Detroit Edison Company, contractors and journeymen have shown how more economic wiring systems actually increase the contractors' business and the business of all.

Some of you contractors here have participated in the activities which this Company has undertaken in range wiring, outdoor metering, and in more ade-

quate wiring systems in new residences. There have been some 70,000 ranges installed in this territory. This has involved contractor business of nearly two million dollars. The installation of 194,000 outdoor meter boxes in Detroit has accounted for some $1,500,000.00 to the trade. These two items alone—ranges and outdoor meter boxes—have definitely increased the amount of work for contractors, for labor, for manufacturers, and for jobbers. I want to emphasize that it would have been impossible to do this work without the cooperation of all concerned in lowering unit costs thereof. The customer work simply would not have been there, and the Company dollars for outdoor meter box installations would not have been there. I think you will agree that these activities have been worth while for all concerned and I hope you will agree that by further combined efforts, we shall open additional wiring markets yet untouched.

The engineers assure me that new types of insulating covering can be materially reduced in thickness and yet provide greater safety than we have ever been able to obtain. Can contractors and journeymen visualize how much additional business could be created immediately, if, by using these smaller diameter conductors, many of the commercial buildings in the City of Detroit could be rewired at a cost that the owners of these buildings could afford to pay? This entirely new wiring market, not heretofore available because of "antiquated" type of materials, has been created and this business can be had while we are all waiting for more large buildings to be built.

Technical data are available to show that the amount of capacity in existing conduits in these commercial buildings could be increased two, three, or even four times with greater safety than we now have—and without the necessity for having to tear buildings apart and completely redecorate in order to do so. This is only one of many possibilities if new ideas are accepted. It is only one of several important developments that have been suggested for the next revision of our codes and standards.

It is certain that if these changes in the Code are given due consideration, and the technical facts upon which they are based are thoroughly understood by everyone in the industry, the Code, and whatever other local ordinances need revision, would be changed immediately, thus permitting you and me to get this business.

Builders

National surveys show that the builders in this section of the country are doing better than an average job in providing housing for people, and buildings for commercial enterprises. The comforts and conveniences which the people receive for their dollar are much greater than in many parts of the country. This indicates that our builders are doing an excellent job. The builders' interest in better wiring, while intangible, is nevertheless important to him. A house which is designed with proper wiring will provide both architects and builders with more work and will materially decrease sales resistance, or perhaps better, will improve customer appeal.

We, in the utility industry, are anxious to be of help to builders and architects. We wish to work with them in order that sufficient wiring may be included in the original building design to the end that electrical comforts of the public may be given due and proper consideration.

Building Owners, Engineers and Architects

Inadequate wiring in apartment houses and office buildings seriously affects rentability. Moreover, there is a distinct competitive factor in favor of edifices which have proper wiring and proper lighting. Wiring is becoming more and more important to the owner because the demand for sufficient facilities is increasing. I talked with a building manager just the other day about this problem. He told me about the increased use of office machinery which taxed wiring in his own building. The Detroit Edison Company's General Office Building is a good illustration. When it was built in 1920, it had the highest level of illumination in the country; and yet in a scant 18 years, we found it necessary to rewire almost the whole building, due to the increased realization of the importance of better lighting to efficiency and health. There is a definite consciousness on the part of the public, of lessors of living quarters and of office space, of the importance of lighting to the individual human being. It is axiomatic, therefore, that better wiring will increase the possible revenue from all types of buildings which are occupied by tenants. Our operating engineers could write an interesting story on the headaches caused by insufficient wiring. Increased maintenance cost, circuit interruptions, tenant dissatisfaction, are among these headaches; and yet, what is the building owner or the building engineer to do about the problem? Let me give you two illustrations.

About a year ago in a midwestern city one of the large 17-story buildings of a national concern needed complete rewiring in order to equip it for modern business needs. The local executives asked for bids. The estimate was about $200,000.00. The project was turned down by the head office because of cost. Management realized that if they improved this one office, they would have to do others, and the advantages to be obtained would not bear such an immense investment. Finally, this company was told of some of the new materials which, if available, would enable them to do this job at a substantially lower cost. When costs show a return which would make it possible for this concern to launch a rewiring program on most of their buildings throughout the country, there will be an entirely new but profitable business for everyone.

There is another outfit in a large eastern city which had a similar rewiring problem. It was a big concern. The bids they had for lighting rewiring—not air conditioning—were terrific, and even then did not include cost of redecorating. Wham! No job—no work! This job can be done, and done safely, with new materials for a cost which is interesting to the owners. Moreover, we are told that not only would the lighting rewiring be taken care of, but that a large air conditioning installation would be made. Further, the utility would make large expenditures in connection with primaries. In other words, if the new materials can be used on this particular job, there will be $150,000.00 worth of work instead of nothing!

These examples are two actual cases of business lost all the way down the line in the electrical industry because the wiring problem has never been solved. Included among those who lost were the building owners themselves. The pity of it is that these losses are entirely unnecessary because the ways and means to correct the situation and to get the business are available.

Michigan Association of Electrical Inspectors

Electrical inspectors are vitally interested in the subject which we are discussing. I indicated earlier that I could show an actual dollar profit to everyone who was interested, or at all concerned, with wiring. This also applies to in-

spectors to some extent—whether paid on a fee or salary basis. Theirs is an important function—important for the public, important for the insurance companies, important for each one of us, because all our interests are bound up in the fundamental requirements of safety to life and property. We owe a debt—all of us—to the inspector. His is not an easy task. Nor, on the whole, is he fully compensated for the public contribution which he makes. The monetary return to the inspector from this program may be small; but there is, nevertheless, a large indirect return to him in the fact that the public will be benefited—both by reason of better quality of wiring materials which are advocated and by the fact that the program makes a distinct contribution to higher standards of living for the public in whose behalf the inspector bends his efforts. The inspector's responsibilities will be simplified when the public can afford adequate wiring and hence can do without substandard materials which are not safe, and other temporary wiring expedients which are positively dangerous.

Speaking for The Detroit Edison Company, we here in Michigan have been blessed—and particularly blessed—with the splendid cooperation of the inspectors. Out of that cooperation have come benefits to us all. All of us in this business will endeavor to show that our activities warrant a continuation of inspector cooperation. After all, their problem is ours and ours theirs.

Labor

I should like to say a word about one very important part of our industry and its profit possibilities. I refer to labor. I honestly believe that, along with all parts of the industry, labor—specifically and generally—stands to profit from this program. If the manufacturer, the jobber, and the contractor profit by reason of increased business, it is clear that increased business will use more labor. The thing rolls up like a snowball. The more people engaged in gainful occupations, the more they can spend to purchase for themselves. Hence the whole economic structure is benefited and the end result is a constant raising of the standard of living.

That's a rather general statement, but we have before us in this district specific examples of how labor has already benefited from this sort of program. In the range installation work in this territory, there have been over 240,000 labor hours provided, most of which would not have been used except for the fact that an increased number of people were able to buy and install electric ranges due to decreased costs of the whole job. Incidentally, it is estimated that on ranges sold in this territory alone, over 500,000 man hours in the *manufacture* of the ranges were provided. Now please get this fact. Nowhere in this country where range installation costs are above $40.00 are there any large number of electric ranges being sold. Wiring of this kind is in competition with other trades (gas, oil, etc.) and the cost is of prime importance. I have heretofore spoken about the outdoor meter box installation program. In this case, also, a vast number of labor hours were provided; and we find in analyzing this job that there would have been no work for labor, no use of materials, if the costs had not been low enough to warrant this Company's going ahead. At old-time costs, in other words, the work would *not* have been done. I cite the figures of this district because I know them in detail. The same general figures could be quoted for other parts of the country where similar conditions exist.

It is not the hours per job that labor is really interested in. It is the total hours of work available. If the man who is building a new house, as well as the man who owns an old house, can afford more copper and more outlets, if the building owner can satisfy his tenants by higher levels of illumination and more copper to take care of office machinery load, if the store and the factory can afford plus lighting, air conditioning, and plus use of electricity in every way, more jobs will be available, more man hours for the electrical craftsman. As has been pointed out earlier, this favorably affects the whole economic structure and, in particular, the labor engaged in manufacturing and installing electrical materials. It makes a huge increase in the labor hours. The program of better wiring accomplishes all these purposes for all of us. Our interests are identical with the interests of labor. Our objective will actually provide more work for more men. I am confident that when the illustrations of what has happened, and what will happen, are thoroughly understood by labor and their representatives, the program will have their whole-hearted cooperation.

* * *

I do not minimize the difficulties in arriving at a complete understanding of the mutuality of interests of all parts of our industry. I am intellectually convinced that we all stand to profit by the prompt adoption of modern wiring methods. We all compose a chain and each link of that chain will be strengthened in its own right, from the manufacturer to the jobber, to the contractor, to labor, through the utility to the public, with the cooperation of the inspectors. With absolute regard to safety of life and property, the industry can, if it will, offer to the public wiring methods at costs which are better within their reach.

We sometimes lose sight of the fact that when costs are too high, one of two things usually happens—either the public refuse to buy at all or they buy competitively. It is unnecessary for me to illustrate this. It is a fact known to us all, but one which we sometimes fail to face. It is, nevertheless, true. If we, who make up the electrical industry in all its parts, keep our costs too high—whether it is for material, for labor, or for kilowatt hours—we put a burden upon our customers, the public, and they either go without our service or substitute something else for it. The end result is that we all lose.

When we all really understand that our own self-interests will be served, we shall get the intelligent cooperation which will bring these benefits to the public. It *is* one for all and all for one!

Balanced Load Building

(*Continued from page* 327)

Perhaps the only thing that does not change with respect to obtaining, in any utility, the closest practical approach to balanced load building, is the fact that the method of approach to the problem must constantly change. There is no single path, no matter how perfectly it may be outlined today, as the result of highly comprehensive studies, that will lead infallibly to the point of maximum balance in load. Whether within or beyond our control, conditions will change tomorrow, and the utility sales program must be revised, not suddenly, but in a manner soundly based upon accurate knowledge that will lead back to the path of balanced load building. Such procedure, without doubt, is most in the public interest, is of greatest satisfaction to the utility's employee group, and is the producer of maximum return to investors.

Roasters the Big News

By R. M. Oliver
Westinghouse Electric and Manufacturing Company, Mansfield, Ohio

An address before the Sixth Annual Sales Conference, Edison Electric Institute, Chicago, March 21-24

ONE HUNDRED AND SIXTY MILLION shiny, new dollars are within easy grasp of the industry represented by the men in this room today.

Last year more than 22 million residential customers paid an average of $2.98 per month for electric service. If you could sell one million electric roasters per year for the next three years, four out of every 30 of these bills would be increased 28 per cent.

The total would be well over $50,000,000 in *added* revenue per year after the third year.

The average annual residence electric bill has increased 9.6 per cent since 1933. You have only to add one electric roaster to a home's appliances to *triple* this increase. The sale of a million roasters per year for three years would step-up every residence electric bill in the United States an average of 7.6 per cent. This would be within 2 per cent of the total increase secured through the last five years of aggressive merchandising effort on *all* appliances, including lighting.

Based on last year's average retail price of $22.17, utilities and dealers would share more than $66,000,000 in additional gross merchandise sales volume.

If 10 per cent of these roaster purchasers became electric cookery conscious and later bought electric ranges, another $49,500,000 in retail sales could be added, bringing the total to more than $109,000,000. This is more than half the total retail value of all electric refrigerators sold last year.

Multiply, subtract, add or divide these figures in any way you choose and the answer is unmistakable. The goose that laid the golden egg has nested on the doorstep of the electrical industry and the egg has hatched into a gloriously golden gosling worth more than $100,000,000 in retail sales and $60,000,000 annually in profitable electric revenue.

My purpose is not to startle you with new deal figures. It is to turn the spotlight upon a rich, new market in which the greatest stake is YOURS.

MR. OLIVER

More today than at any time within the history of the electric business the responsibility for load and revenue as well as merchandise sales volume is in your lap.

Twenty years ago the vital need of every electric service company was increased load at any cost. Today you who direct electric utility policies demand *revenue*. The reason is not strange. Within the last 19 years average residential kilowatt hour consumption has increased 229 per cent, but utilities received less revenue for each kilowatt hour sold. You must now deliver almost two kilowatt hours of electric energy to get the same revenue formerly derived from the sale of one.

Electric rates are down to stay and yours is the great responsibility of selling more electricity and increasing net revenue received from each kilowatt hour sold.

The problem is crystal-clear and you have been unanimous in defining it:

1. *More electricity must be sold in higher rate brackets.*

2. *More electricity must be sold to low use customers.*

A prominent utility executive writes: "The answer to continued and profitable sales lies in selective selling, with due regard to system capacity, capital expenditures, cash requirements and revenue needs. Services for promotion and sale under such circumstances should be chosen with particular attention to those which:

1. Are well diversified, requiring little if any investment in distribution systems.
2. Have favorable load characteristics.
3. Have high use-value to customers to assure more stable revenues.
4. Earn higher net revenues from high step blocks of rate structure."

This sounds like a big order and it is; but the pendulum has already started to swing.

Let us step back to 1934. The month is June. Three men are feverishly at work developing an idea which was to influence the progress of an industry. It seemed incredible. Thousands of miles were traveled. Facts were collected and analyzed. Finally the plan takes form. One of the men picks up a piece of paper and writes four words. The four words are BETTER LIGHT - BETTER SIGHT.

Today there is hardly a man, woman or child in the United States who has not enjoyed the benefits of improved seeing through better lighting.

For utilities — the pronouncement of those four words marked a turning point in electric revenue which increased the average price of new residential kilowatt hours sold 23 per cent within the last five years.

It is natural for you to ask:

"Is there today an equally vital human want?

"Is there a companion 'Road to Revenue?'

"Is there an approach to the unsold, low use customer equal to BETTER LIGHT - BETTER SIGHT?

"Is there an unrecognized neglected market meeting every stated need of the electrical industry today?"

The answer is emphatically "YES."

History has repeated.

Four magic words again bring ease, convenience and modernity into American homes, the pleasant tinkle of coins into utility cash registers.

Those four words are:

EASIER COOKING - EASIER LIVING.

Spearhead of the Better Sight activity was the I.E.S. lamp. Spearhead of today's new electric revenue crusade is the ELECTRIC ROASTER. Millions now enjoy better sight because of the I.E.S. lamp. Millions will enjoy easier, better cooking because of the electric roaster.

You are vitally interested in the electric roaster market because it can be termed a "life line" of the electric industry today—bringing easier cooking - easier living to millions of your customers and assurance of a decent return to thousands of investors in utility securities.

The electric roaster, retailing for less than $30, ranks fourth among electrical load builders with an annual consumption of 340 kwhr exceeded only by that of the refrigerator, range and automatic water heater. Like the I.E.S. lamp, electric roasters use current sold at the lighting rate.

For example, take a typical step-down electric rate. The first 40 kwhr per month are sold at 5½c.; the next 60 at 3c., and all over 100 kwhr per month at 2c. Based upon this rate, an electric range customer, using approximately 176 kwhr per month with lighting, refrigeration, cooking and miscellaneous appliances, would pay a monthly bill of $5.52. The average cooking rate is 2.3c. Here is the electric roaster customer. Without the range the average monthly use is 72 kwhr. Twenty-eight are added by the roaster. The roaster customer pays a monthly electric bill of $4. Electricity used for cooking is purchased at an average rate of 3c. The average over-all rate is 4c. per kwhr compared with 3.1c. paid by the range user. The roaster is a socket appliance plugging in anywhere. There is no installation cost.

The added revenue-plus of one electric roaster is 28 kwhr per month at 3c. per kwhr, an average of 84c. per month, $10.08 per year. Not one cent of capital investment is required.

All well and good, you may ask, "Is the roaster used? If so, how much, and for what? How do we know? What do women say?"

We have the facts. Last December, mid-winter, during the busy pre-holiday season, Westinghouse mailed a questionnaire to 1170 women who had owned roasters more than a year. They resided in every state in the union; one in Alaska, two in Hawaii and seven in Canada. More than a third replied.

Though 13 per cent of these roaster users have maids, 90 per cent do most of their own cooking. Six out of ten use their roasters the year 'round. Eleven per cent reported daily use; half use their roasters anywhere from five to ten times a month to twice every day. Roasters are kept in the kitchen and though none of the roasters were accompanied by special stands, many women had obtained them anyway. Food to be cooked governs use of the roaster. Roasting, baking, whole meal cooking, broiling and the cooking of poultry are favorite uses in the order named. The most had good ranges—63 per cent gas and 15.8 per cent electric. The range was preferred only for frying, broiling and quick surface cooking.

The question: "What do you like most about your roaster?" brought answers as follows:

Easier to use—36.6 per cent.
Roaster qualities—19.8 per cent.
Better tasting foods—17.8 per cent.

To the question: "What do you like least about your electric roaster?" 22.2 per cent replied *nothing*.

Scores of these women took the trouble to write comments like these on the backs of questionnaires returned:

From Milwaukee: "There is nothing better for roasting or baking. The food prepared in the electric roaster always tastes better."

From Omaha: "It makes cooking such a pleasure. I don't see how I ever got along without it."

From St. Louis: "I would say my electric roaster is the nicest thing that has come to me for some time. I like the size and shape—so easy to clean, so dependable, and such an all-round joy to use."

These statements sound like an advertising man wrote them. In a sense this is true. Advertising *women* wrote them; roaster users. Owner-praise is the best advertising any electric appliance can have.

This is only half of the story. Every roaster user is a pre-sold electric range prospect. Those of you who are aggressively promoting both electric ranges and roasters know this to be true. Why? Because a roaster user knows that electric cooking costs only half as much as she previously believed. She is sold. She knows perhaps for the first time in her life that electricity will *cook* as well as run the vacuum cleaner and light the living room. She knows that electric cooking is both practical and economical.

The Central Hudson Gas and Electric Company, for reasons of its own, last year put its entire efforts behind electric roasters rather than ranges. Despite this condition, the electric range business in this territory ran on a par with 1937 when the company was actively promoting ranges.

Every electric utility with an electric cooking rate has a made-to-order powerful closing argument for an electric range. The figures tell their own story. The total bills just computed were $5.52 with the range and $4 with the roaster. The difference—or total additional cost of enjoying complete electric cooking with an electric range is only $1.52—a saving of approximately 1c. per kwhr. on all electricity purchased each month. If an electric water heater is added, the saving is even greater. Where is there a smart appliance salesman who can't go to town on that kind of a closing argument?

Electric roasters today rank fifth in unit sales of all appliance retailing for $20 or more. With virtually no planned effort, sales increased from 50,000 units in 1934 to approximately a quarter of a million last year, proof of spreading popularity. There are today more than 21,000,000 families living in wired homes who have yet to experience the taste-thrill, greater convenience, ease and economy of electric roaster cooking —this is 97 out of every 100 wired homes in the United States. Your next door neighbor is a prospect.

The electric roaster satisfies every stated need of the electric utility industry today.

1. It requires no new investment in distribution systems.
2. Its load characteristics are definitely favorable.
3. It is a practical appliance insuring stable revenue.
4. It produces higher net revenue because current to operate it is bought at higher blocks in rate structure.

A $160,000,000 business is knocking at the door and the time is ripe to let it in.

Leading roaster manufacturers through the Modern Kitchen Bureau are cooperating with utilities and dealers to push the roaster sales curve up, Up, UP!

The campaign is under way now. On

every side from utilities, dealers, the trade press and women's magazines it's ROASTERS. Not since the days of the "fifty degree danger line" in '26, when the electric refrigerator bureau was formed, has an appliance been so spontaneously hailed as a potential champion. For electric roasters today are at exactly the same point occupied by refrigerators in 1926—the dawn of the golden age. The electric roaster is now getting the same advertising stimulus the refrigerator got at the time when it, too, stood at the crossroads.

Here is a sample, with more to come. Since the first announcement of the three-year Modern Kitchen Bureau program, over 100,000 words of roaster news have appeared in the columns of the trade press. Leading women's and home improvement magazines are planning roaster feature articles. Daily letters are received announcing new publicity to come, requesting detailed information about roaster activity plans.

It is small wonder! Look at the three-year program of national advertising. Here is the 1939 schedule. Twenty-page and half-page ads in leading national magazines.

McCall's—March, May, July, September, November, December.

Woman's Home Companion—April, June, July, October, November, December.

Saturday Evening Post—May 27, June 17, July 1, July 15, Oct. 28, Nov. 18, Dec. 2, Dec. 16.

Here is a sample. This full-page advertisement appears in the July issue of *McCall's,* on the newsstands June 10. Isn't it a honey? Two colors. Interesting pictures. Dramatic speed copy. It spotlights "See For Yourself Month," the big summer selling push. Eight more like it in half-page size back up your spring and summer selling efforts.

Here's the utility and dealer tie-in package to pipe in the full force of this advertising behind the retail sales counter.

Colorful window banners and counter cards! Ad blow-ups! Tie-in mats for newspaper ads. Radio spot announcements. Cooking school programs. Ad reprints and folders. Special newspaper sections made-up and ready for local newspapers to use. A complete, easy-to-follow selling guide for retail sales people. Everything—even a three-act playlet with which you can introduce your local roaster selling program to employees and your sales organization. It's all here. Ready to go—Now. Complete kits containing samples of all of these materials were mailed last month to 4400 utility executives. This month similar sample kits will be mailed by the Modern Kitchen Bureau to 2300 department store merchandising managers. Dealers may obtain kits free from distributor salesmen contacting them or from the Modern Kitchen Bureau in response to ads now appearing in Electrical Merchandising and Electrical Dealer.

The roaster industry has united with the Modern Kitchen Bureau in bringing the story of Easier Cooking - Easier Living to the homemakers of America.

Individual electric roaster manufacturers are each backing the Modern Kitchen Bureau program with strong advertising and aggressive selling of their own brands.

There remains but one more action needed to bridge the gap separating utilities and dealers from this $160,000,000 pot of gold.

You alone can take this action. The greatest stake in the rich electric roaster market is yours. The electric roaster, like the electric iron in 1912, the refrigerator in 1926 and the I.E.S. lamp in 1934, is today in the promotional stage of development.

The electric roaster needs—must have—the full force of a major activity promotion on the part of utilities in their own local territories.

Here then is the roaster revenue platform. Upon your action now will future revenue be determined. To achieve sales success, the electric roaster must have:

1. Enthusiastic support of top utility management.
2. Year 'round activity tying in with MKB and manufacturer programs.
3. Utility employee ownership and selling support.
4. Intensive local advertising by utility, department store and dealer . . . featuring Easier Cooking - Easier Living.
5. Continuous retail window and floor display.
6. Frequent sales-building demonstrations for employees and customers in groups and in the home.
7. Specialty selling effort and special compensation for retail sales people.
8. Local "use the user" sales stimulus.

This is the ROAD TO REVENUE. Travel it.

ELECTRIC LIGHT AND POWER INDUSTRY IN THE UNITED STATES

Statistical Bulletin No. 6, 1938

E.E.I. Pub. G-2. A report of the Edison Electric Institute, 420 Lexington Ave., New York, N. Y., 34 pages, 42 tables, 7 charts. Price 30¢ to members and their employees; 75¢ to non-members in the U.S.A.; 85¢ to foreign countries.

THE continued expansion of electric service in spite of the great decline in general business activity during 1938 is emphasized in the Institute's Annual Statistical Bulletin, now off the press.

"The most significant aspect of the year's operations," the Bulletin states, "was the further increase in the use of energy by residential, farm and small commercial customers. This growth occurred during a year when the general level of business was below that of 1937. It is further evidence of the results achieved by the continuing efforts of utility companies, in cooperation with appliance dealers, in building up load and of the growing recognition by customers of the value and cheapness of electric service in the home, on the farm and in small commercial establishments.

"The marked change which has taken place in the last thirteen years in the proportion of the total energy used by different classes of customers is emphasized by the fact that, in 1938, 17 per cent of the electric energy distributed was for residential use—as compared with only 9.7 per cent in 1926. Small commercial customers consumed 16 per cent of the total energy distributed in 1938, against 13.5 per cent in 1926, and large light and power customers took only 40.4 per cent in 1938, compared with 46.2 per cent in 1926. The growth in the use of electricity by residential, farm and small commercial customers has increased the stability of the industry markedly over the last thirteen years and is evidence of the more general acceptance of electricity by these customer groups."

At the close of the year, the electric light and power industry was serving 27,851,471 customers of all classes, an increase of 687,484 customers or 2.5 per cent over the close of the previous year. Of these total customers, 1,406,579 were farms, which represented the addition of 165,074 during 1938. Revenues received from sales of electricity to all customers amounted to $2,168,495,200, a decline of $12,292,400 from the year before.

In contrast to the decline in revenues, total expenses showed further increases. The preliminary income statement carried by the Bulletin indicates that, while operating expenses registered a slight de-

crease, taxes and charges for depreciation continued their upward surge. Taxes grew by about $12,000,000 and provisions for retirements and depreciation by a similar amount. "Accounting costs," states the Bulletin, "were increased considerably. Requirements of governmental bodies, largely for statistical purposes, as well as the extension of service into rural areas, have greatly increased accounting expenses. It is conservatively estimated that the industry spends annually some $12,500,000 in the filing of reports with regulatory and other bodies." As a result of these factors, it is estimated that net operating income declined by 2.6 per cent from 1937 and net income, after all charges, by 6.2 per cent.

At the close of 1938, the plants of the electric light and power industry, including the TVA, the rural cooperatives and municipal plants (but excluding other federal projects) had a generating capacity of 36,330,380 kilowatts, a net increase (over plants dismantled) of 1,370,039 kilowatts. Steam plants showed a net increase of 1,261,608 kilowatts, or 92 per cent of the total, while water power plants gained 29,915 kilowatts. Diesel engine plants registered a net gain of 78,536 kilowatts.

During 1938, approximately $482,000,000 was spent for new construction and modernization by the electric light and power industry (exclusive of federal projects), the largest sum spent since 1931.

"The year 1938," states the Bulletin, "was marked by a slowing up in the record sales of appliances established during 1937. This decrease, however, did not deflect the continued vigor which has accompanied the several promotional programs initiated in the past four years, among which are 'Better Light—Better Sight'; 'The Electric Water Systems Council'; 'The Commercial Electric Cooking Council' and the forward looking activity comprising the 'Modern Kitchen' program. Greater use of electric appliances, which have gone into the farm and urban homes following the aggressive promotional activities of the industry in cooperation with dealers and manufacturers, has brought the average annual use in the non-farm home to 845 kwhr per year and on the farm to 1,045 kwhr. Utilization of energy in the home increased 52 kwhr per customer in 1938 over the previous year, while the average revenue per kilowatt-hour for this service dropped to a new low figure of 4.21 cents, a decrease of 4.1 per cent from the average revenue in 1937.

CONVENTIONS AND MEETINGS

JUNE

6-8 EDISON ELECTRIC INSTITUTE, Waldorf-Astoria Hotel, New York, N. Y.
18-21 Public Utilities Advertising Association, New York, N. Y.
21-24 Canadian Electrical Association, Digby, N. S.
26-29 National Association of Cost Accountants, Atlantic City, N. J.
26-30 American Institute of Electrical Engineers, San Francisco, Calif.
27-30 National District Heating Association, Pennsylvania Hotel, New York, N. Y.

JULY

26-29 American Society of Civil Engineers, St. Francis Hotel, San Francisco, Cal.

AUGUST

21-25 Illuminating Engineering Society, Hotel Fairmont, San Francisco, Cal.

OCTOBER

2-6 National Restaurant Association, Chicago, Ill.
5 Third Annual Conference, Commercial Electric Cooking Council, Chicago, Ill.
9-12 American Gas Association, New York City, N. Y.
9-12 National Electrical Contractors Association, Bellevue-Stratford Hotel, Philadelphia, Pa.
16-20 National Safety Council, Atlantic City, N. J.
23-27 National Electrical Manufacturers Association, Palmer House, Chicago, Ill.

SEPTEMBER

21-22 Wisconsin Utilities Association, Accounting Section, Plankinton Hotel, Milwaukee, Wis.

OCTOBER

19-20 Empire State Gas and Electric Association, Westchester Country Club, Westchester, N. Y.

NOVEMBER

6-7 Wisconsin Utilities Association, Annual convention, Schroeder Hotel, Milwaukee, Wis.

Progress in Rural Load Building

(*Continued from page* 300)

rates does not necessarily represent a tremendously high increase in total bill, because in one case the installation represented an inefficient application of electricity to the customer's problem, while the other represented an efficient use of it.

After the plan, the crux of the situation is the man power. You can't get this business and keep it by sending out the janitor, the stoker of the boiler plant, or some numbskull that you can't find another place for. I have nothing against the stoker or the janitor. As a matter of fact, some of our best sales people are ex-linemen; but they have been well trained before being put into the selling end of our business. After training they make excellent salesmen for the low income customer, as they know how these customers live and how they react to new ideas. Selling today is a science—you must have trained men.

For example, to build farm load you must have men who are farm men themselves, farm trained, and whose whole life is wrapped up in farming, men who know farming and farmers as well as anyone possibly can, who are not actually working full time on the farm. They must be the type who on a day off will go to a cattle sale, a grange picnic, or a red hot milk meeting. For the rural load you should have men who live in the country, who know rural conditions, and who use in their own homes every device they are trying to sell. It is only by so doing that they can know what the customer should buy, and, in reality, to be successful they must act not as your salesmen but as the customer's purchasing agent.